Fishery Management Report No. 06-35

2005 Lower Cook Inlet Annual Finfish Management Report

by

Lee F. Hammarstrom

and

Mark S. Dickson

June 2006

Alaska Department of Fish and Game **Divisions of Sport Fish and Commercial Fisheries**

Symbols and Abbreviations

The following symbols and abbreviations, and others approved for the Système International d'Unités (SI), are used without definition in the following reports by the Divisions of Sport Fish and of Commercial Fisheries: Fishery Manuscripts, Fishery Data Series Reports, Fishery Management Reports, and Special Publications. All others, including deviations from definitions listed below, are noted in the text at first mention, as well as in the titles or footnotes of tables, and in figure or figure captions.

Weights and measures (metric)

centimeter	cm
deciliter	dL
gram	g
hectare	ha
kilogram	kg
kilometer	km
liter	L
meter	m
milliliter	mL
millimeter	mm

Weights and measures (English)

cubic feet per second	ft^3/s
foot	ft
gallon	gal
inch	in
mile	mi
nautical mile	nmi
ounce	oz
pound	lb
quart	qt
yard	yd

Time and temperature

day	d
degrees Celsius	°C
degrees Fahrenheit	°F
degrees kelvin	K
hour	h
minute	min
second	s

Physics and chemistry

all atomic symbols	
alternating current	AC
ampere	A
calorie	cal
direct current	DC
hertz	Hz
horsepower	hp
hydrogen ion activity (negative log of)	pH
parts per million	ppm
parts per thousand	ppt, ‰
volts	V
watts	W

General

Alaska Administrative Code	AAC
all commonly accepted abbreviations	e.g., Mr., Mrs., AM, PM, etc.
all commonly accepted professional titles	e.g., Dr., Ph.D., R.N., etc.
at	@
compass directions:	
east	E
north	N
south	S
west	W
copyright	©
corporate suffixes:	
Company	Co.
Corporation	Corp.
Incorporated	Inc.
Limited	Ltd.
District of Columbia	D.C.
et alii (and others)	et al.
et cetera (and so forth)	etc.
exempli gratia (for example)	e.g.
Federal Information Code	FIC
id est (that is)	i.e.
latitude or longitude	lat. or long.
monetary symbols (U.S.)	$, ¢
months (tables and figures): first three letters	Jan,...,Dec
registered trademark	®
trademark	™
United States (adjective)	U.S.
United States of America (noun)	USA
U.S.C.	United States Code
U.S. state	use two-letter abbreviations (e.g., AK, WA)

Measures (fisheries)

fork length	FL
mideye-to-fork	MEF
mideye-to-tail-fork	METF
standard length	SL
total length	TL

Mathematics, statistics

all standard mathematical signs, symbols and abbreviations	
alternate hypothesis	H_A
base of natural logarithm	*e*
catch per unit effort	CPUE
coefficient of variation	CV
common test statistics	(F, t, χ^2, etc.)
confidence interval	CI
correlation coefficient (multiple)	R
correlation coefficient (simple)	r
covariance	cov
degree (angular)	°
degrees of freedom	df
expected value	*E*
greater than	>
greater than or equal to	≥
harvest per unit effort	HPUE
less than	<
less than or equal to	≤
logarithm (natural)	ln
logarithm (base 10)	log
logarithm (specify base)	$\log_2$, etc.
minute (angular)	'
not significant	NS
null hypothesis	H_O
percent	%
probability	P
probability of a type I error (rejection of the null hypothesis when true)	α
probability of a type II error (acceptance of the null hypothesis when false)	β
second (angular)	"
standard deviation	SD
standard error	SE
variance	
population	Var
sample	var

FISHERY MANAGEMENT REPORT NO. 06-35

2005 LOWER COOK INLET ANNUAL FINFISH MANAGEMENT REPORT

by

Lee F. Hammarstrom
and
Mark S. Dickson
Alaska Department of Fish and Game, Division of Commercial Fisheries, Homer

Alaska Department of Fish and Game
Division of Sport Fish, Research and Technical Services
333 Raspberry Road, Anchorage, Alaska, 99518-1565

June 2006

The Division of Sport Fish Fishery Management Reports series was established in 1989 for the publication of an overview of Division of Sport Fish management activities and goals in a specific geographic area. Since 2004, the Division of Commercial Fisheries has also used the Fishery Management Report series. Fishery Management Reports are intended for fishery and other technical professionals, as well as lay persons. Fishery Management Reports are available through the Alaska State Library and on the Internet: http://www.sf.adfg.state.ak.us/statewide/divreports/html/intersearch.cfm. This publication has undergone regional peer review.

Lee F. Hammarstrom and Mark S. Dickson
Alaska Department of Fish and Game, Division of Commercial Fisheries,
3298 Douglas Place, Homer, AK 99603, USA

This document should be cited as:
Hammarstrom, L. F. and M. S. Dickson. 2006. 2005 Lower Cook Inlet annual finfish management report. Alaska Department of Fish and Game, Fishery Management Report No. 06-35, Anchorage.

TABLE OF CONTENTS

Page

TABLE OF CONTENTS (Continued)

Page

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

LIST OF APPENDICES (Continued)

ABSTRACT

The 2005 Lower Cook Inlet commercial salmon fishery was characterized by lower than average sockeye salmon *Oncorhynchus nerka* harvests and higher than average pink *O. gorbuscha* and chum *O. keta* salmon harvests. The all-species harvest totaled approximately 2.648 million fish, dominated by pink salmon at 87% and sockeye salmon at 9%. The exvessel value was approximately $1.63 million, the fourth lowest over the past decade. Participation remained at low levels for the only two allowable gear groups, with commercial purse seine effort showing a slight increase over recent seasons, while commercial set gillnet effort experienced a marginal decrease. Salmon enhancement continued to play a key role in commercial harvests due to numerous sockeye salmon lake stocking projects and two different pink salmon hatcheries. The harvest of salmon for cost recovery purposes by hatchery facilities once again comprised a significant proportion of the overall Lower Cook Inlet commercial catches, estimated at approximately 84% in numbers of fish and 45% in exvessel value.

The Southern District Personal Use Coho Salmon Fishery in Kachemak Bay produced a harvest of an estimated 830 coho salmon *O. kisutch*, falling short of the guideline harvest range of 1,000 to 2,000 coho salmon for the first time since the new harvest range was implemented in 1999. Participation in the fishery, at 69 permits actively fished, was similar to the previous two seasons.

The commercial Pacific herring *Clupea pallasi* fishery in Lower Cook Inlet was closed during 2005 for the seventh consecutive season due to continuing low abundance levels.

Key words: Lower Cook Inlet, commercial salmon harvest, salmon enhancement, hatchery, cost recovery, personal use fishery, purse seine, set gillnet, escapement, sockeye *Oncorhynchus nerka*, pink *O. gorbuscha*, chum *O. keta*, coho *O. kisutch*, Pacific herring *Clupea pallasi*.

2005 COMMERCIAL SALMON FISHERY

INTRODUCTION

The Lower Cook Inlet (LCI) management area, comprised of all waters west of the longitude of Cape Fairfield, north of the latitude of Cape Douglas, and south of the latitude of Anchor Point, is divided into five fishing districts (Figure 1). The Barren Islands District is the only fishing district where no salmon fishing occurs, with the remaining four districts (Southern, Outer, Eastern, and Kamishak Bay) separated into approximately 40 subdistricts and sections to facilitate management of discrete stocks of salmon and herring.

The 2005 LCI all-species salmon harvest of 2.648 million fish (Table 1; Figure 8) was the fourth highest during the past decade, exceeding the recent 10-year average of 1.989 million by about 33% (Appendix A5). Although the overall harvest failed to achieve the cumulative preseason forecast, strong returns of chum salmon *Oncorhynchus keta* continued for the sixth straight year, resulting in a commercial catch of nearly 100,000 fish, the second highest since 1988. Prices paid for salmon this season yielded an estimated LCI exvessel value of approximately $1.63 million (Table 7), making the value of the 2005 harvest only about 80% of the recent 10-year average and the fourth lowest during that time period (Appendix A2). Seine fishing effort was a slight increase over recent seasons, but with only 29 of 86 permit holders making deliveries this season (Appendix A1), participation continued to follow a recent low trend. The number of active set gillnet permits was only 17 (Appendix A1), the lowest level since 1994.

Once again, LCI commercial salmon harvests in 2005 relied heavily on the success of hatchery and enhanced fish production. An estimated 72% of the sockeye salmon *O. nerka* harvest in numbers of fish was attributed to lake stocking and fertilization projects, most of which were originally begun by the Alaska Department of Fish and Game (ADF&G) but are currently maintained by Cook Inlet Aquaculture Association (CIAA). These projects were conducted at

Leisure and Hazel Lakes in the Southern District, Kirschner Lake in the Kamishak Bay District, and Bear Lake in the Eastern District. Another traditional sockeye salmon enhancement program, conducted by the Nanwalek Salmon Enhancement Project (NSEP) in conjunction with Chugach Regional Resources Commission (CRRC) at English Bay Lakes in the Southern District, failed to contribute to commercial LCI harvests this season. However, small numbers of fish resulting from this project were harvested in local subsistence fisheries. Unfortunately, the overall area-wide commercial harvest of sockeye salmon in LCI, at just under 233,000 fish, was considerably below the recent 10-year average of 324,000 (Appendix A13).

Pink salmon *O. gorbuscha* production from Tutka Hatchery, operated by CIAA, far surpassed expectations this season with an overall estimated run of approximately 1.7 million fish (Table 9), representing the third highest figure on record for the facility. The total catch of 1.632 million Tutka Hatchery pink salmon exceeded the preseason harvest projection by about 60%. Another pink salmon hatchery, located in Port Graham of the Southern District, experienced a weaker than expected return, with a harvest totaling around 511,000 fish.

As has been the case since hatchery programs were taken over by private non-profit (PNP) corporations in LCI, a significant portion of the salmon harvest was utilized as hatchery cost recovery to recoup expenses incurred by the various stocking and enhancement projects throughout the management area. Almost 85% of the all-species salmon harvest in numbers of fish was taken by CIAA and Port Graham Hatchery Corporation (PGHC) to support the lake stocking programs and Tutka and Port Graham Hatcheries operations, representing about 45% of the exvessel value of the LCI salmon fishery (Table 7). Similar to the past several seasons, strong natural runs of chum salmon bound for LCI drainages provided commercial fishermen with the second highest harvest of that species since 1988 at almost 100,000 fish. It should be noted that all chum salmon in LCI are a result of natural production since enhancement programs for this species have not occurred for many years.

The shortage of regular tender service in remote districts, a notable factor that has affected the amount and distribution of seine effort, and ensuing harvest of salmon, in LCI over the past decade, once again influenced overall harvests during 2005. The policy to severely restrict or eliminate such remote tender service was adopted in 1994 by major processors as a means to reduce costs. Prior to that time, processors routinely stationed a tender (or tenders) in remote districts in anticipation of salmon harvests, even when run strengths and catches were marginal. Once that policy was abandoned, however, seiners were forced to devise their own means to transport fish from these remote areas to a processing plant in Homer or elsewhere. Due to equipment limitations and the high cost of contracting out for tendering services, significant numbers of fishermen were often unable to fish in remote areas, while others retained the flexibility to fish these traditional areas because of onboard chilling equipment. Despite relatively strong pink salmon returns to LCI in 2005, generally weak markets resulted in a lack of buyers for this species, which in turn contributed to the reduced tender service in remote areas. In spite of the worldwide market situation, prices for all salmon species except Chinook *O. tshawytscha* and pink improved for the second consecutive season (Appendix A3), with the latter still showing an increase over the previous season. Nonetheless, the low prices paid for the most abundant species, pink salmon, coupled with the small numbers of available buyers and limited tender service, frequently dictated the fishing strategy of individual fishermen, even to the point of total non-participation, thus contributing to continuing low levels of seine effort.

PRESEASON FORECAST

The projected 2005 LCI all-species salmon harvest of approximately 3.78 million fish was more than twice the recent 20-year average actual harvest. Formal total forecasts for natural salmon runs other than pink salmon were not prepared because escapement and age, weight, and length data are limited for those species. However, catch projections were calculated from relative estimates of parental run size, average age composition data, and recent relative productivity trends.

Preseason harvest projections and actual catches for all species in 2005 are listed below:

Species	Projected Harvest	Actual Harvest	1985–2004 Average
Chinook	1,300	622	1,451
Sockeye	296,700	232,678	276,537
Coho	13,600	9,126	11,994
Pink	3,433,000	2,306,842	1,265,089
Chum	35,000	98,602	57,627
Total	**3,779,600**	**2,647,870**	**1,612,698**

Enhanced runs to Leisure and Hazel Lakes in the Southern District, Kirschner Lake in the Kamishak Bay District, and Bear Lake in the Eastern District were expected to comprise the bulk of the LCI sockeye harvests this season. The sockeye run to the English Bay Lakes system in the Southern District, increasingly important in recent years, was not expected to produce any harvestable surplus for commercial set gillnet harvests in LCI due to a weak forecast resulting from a lack of stocking in 2001 and 2002. Although Chenik Lake in the Kamishak Bay District benefited from regular fry stocking and intermittent fertilization during the 1980's and early 1990's, the program was suspended after 1996 due to an epizootic of Infectious Hematopoietic Necrosis Virus (IHNV) within the system in previous years. Despite this lack of enhanced production, adult sockeye salmon returns to Chenik Lake in both 2003 and 2004 were surprisingly good, with that of 2004 resulting in the first directed effort at this stock in over a decade and a commercial harvest of over 33,000 sockeye salmon. Because of the unexpectedly strong runs the previous two seasons, the outlook for the adult sockeye return in 2005 was cautiously optimistic, with fishermen hoping for reasonable harvest opportunities.

The return to the Tutka Bay Hatchery was once again expected to provide the majority of the pink salmon catch in LCI, with a forecasted harvest of over 1.0 million fish. The projection was based on typical recent-year survivals from a release of approximately 48 million fry from Tutka Hatchery in 2004 (Appendix A34). Since CIAA had suspended operations at Tutka Hatchery at the conclusion of the 2004 season, no broodstock collection was planned in 2005 and CIAA anticipated utilizing all returning hatchery pink salmon for cost recovery purposes. Additionally, 2005 marked the final adult pink salmon return to Tutka Hatchery since the last planned fry release occurred in 2004. The pink salmon return to Port Graham Hatchery was forecasted to produce a harvest of about 675,000 fish, all of which would be likely be required for cost recovery, while broodstock requirements were expected to total an additional 191,000 fish.

Strong pink salmon escapements to major Outer and Kamishak Bay Districts systems in 2003 contributed to a harvest projection of over 1.7 million naturally produced pink salmon throughout the entire LCI management area this season. Port Dick, Windy, Rocky, and Nuka Island Subdistricts in the Outer District, as well as Ursus Cove and Bruin Bay Subdistricts in the Kamishak Bay District, all figured to provide the most potential for harvestable surpluses, but the projected fishing effort in these remote districts was uncertain due to the weak markets and unknown levels of available tender service.

Due to five consecutive seasons of relatively strong chum salmon runs and catches in LCI, the chum salmon harvest outlook in 2005 once again appeared bright. Most west-side LCI systems experienced reasonably good escapements during the 2000 and 2001 parent years, and recent years' runs to area systems have continued to display a generally encouraging trend. Numerous systems, especially those in northern Kamishak Bay, seemed to be responding positively to conservative management measures employed in the 1990's decade, while chum runs to the larger Big and Little Kamishak Rivers have also been comparatively strong during the previous 5 years. The good catches during the past five seasons, as well as the recent overall trend, suggested that harvest opportunities for chum could be numerous in 2005.

2005 SUMMARY BY SPECIES

Chinook Salmon

The 2005 harvest of Chinook salmon, not normally a commercially important species in LCI, was the lowest for this species since 1980 at 622 fish (Table 2; Appendix A12), less than half of the 20-year average of 1,450. Virtually the entire catch came from the Southern District, primarily resulting from enhanced production at Halibut Cove Lagoon. Set gillnetters accounted for about 84% of the LCI Chinook catch, considered around the normal proportion for that gear group, with purse seiners taking the remaining 16%.

Sockeye Salmon

The 2005 sockeye salmon harvest of 232,700 fish (Table 3; Figure 9) was the third lowest for LCI since 1995, representing about 85% of the 20-year average of 276,500 (Appendix A13). Despite accounting for less than 10% of the LCI salmon harvest in total numbers of fish, sockeye salmon still provided slightly more than half of the exvessel value of the entire salmon fishery this season (Table 7). The 2005 LCI commercial sockeye harvest was characterized by weaker than anticipated runs to nearly all enhanced systems, the exception being the English Bay Lakes run. Natural runs to systems within the management area were considered fair to good, with that of Chenik Lake in the Kamishak Bay District contributing to commercial seine harvests. As has been the case during past seasons, non-local stocks were thought to have intermixed with local stocks while migrating through the Southern District terminal harvest areas, providing additional sockeye salmon for harvest there.

Sockeye salmon runs to enhancement sites, which typically provide the bulk of the LCI sockeye catch, were stronger than the exceptionally poor returns experienced in 2004 but still somewhat weaker than anticipated. In the Southern District, harvests of enhanced runs of sockeye salmon returning to Leisure and Hazel Lakes were predicted to cumulatively total about 114,000 fish, but the estimated combined harvest amounted to only around 95,000 fish (Figure 10; Appendix A15). This figure was well below the recent 10-year average of nearly 170,000. This year's harvest figure also represented the fourth lowest combined total since adults began

returning to both the Leisure and Hazel Lakes enhancement sites in 1991 (prior to that year, only Leisure Lake sockeye salmon contributed to the harvests).

Also in the Southern District, the sockeye run to English Bay Lakes was expectedly weak but nonetheless still achieved the desired inriver goal, while providing modest harvest opportunities for subsistence set gillnetters in the two local villages. The nearby commercial set gillnet fishery in waters of Port Graham Subdistrict remained closed for the duration of the sockeye salmon run in order to protect fish for escapement purposes, while the subsistence gillnet fishery in those waters was only allowed to reopen once the escapement goal was assured. The continued viability of the sockeye salmon returns to the English Bay Lakes system may rest on the future success of the ongoing rehabilitation project originally initiated by ADF&G in the late 1980's and presently being conducted by Chugach Regional Resources Commission (CRRC) in conjunction with NSEP, operated by the village of Nanwalek. This sockeye project has encountered setbacks in recent seasons due to viral and disease outbreaks in the pen rearing of juveniles, as well as unexpected adult behavior that resulted in the failure to collect any broodstock in 2001 and 2005, and difficulty in collecting broodstock in 2003. For the 2005 season, English Bay Lakes sockeye salmon fry were reared under contract at Trail Lakes Hatchery in Moose Pass, with a portion being released back into the English Bay Lakes system in October.

In the Kamishak Bay District, the enhanced run of sockeye salmon to Kirschner Lake produced a catch of 15,000 fish (Table 3), failing to achieve the preseason harvest forecast of just over 24,000 fish. All sockeye salmon returning to Kirschner Lake in 2005 were utilized for hatchery cost recovery.

At Bear Lake in Resurrection Bay of the Eastern District, the cumulative seine and hatchery catch of "early run" sockeye salmon totaled just under 57,000 fish (Table 3), falling short of the preseason harvest forecast of 74,000 sockeye salmon. Despite the shortfall, the desired inriver sockeye goal for Bear Lake was achieved.

The LCI management area has only six lake systems with significant naturally occurring sockeye salmon runs, with three achieving or slightly exceeding their sustainable escapement goals (SEGs) in 2005, one falling about 300 fish short of its goal, and the fifth failing to achieve its goal by an estimated 4,000 fish. The sixth system has no formal escapement goal. In East Nuka Bay Subdistrict of the Outer District, Delight Lake escapement, enumerated via a picket weir and aerial surveys, exceeded the goal of 6,000 to 12,600 sockeye with an estimate of 15,200 fish (Appendix A23). The peak daily aerial survey escapement estimate at nearby Desire Lake totaled only 4,780 sockeye, well shy of the SEG range of 8,800 to 15,200. No directed commercial fishing effort on sockeye salmon runs bound for these two systems in East Nuka Bay was allowed in 2005 in order to protect fish for escapement. A third system in East Nuka Bay, known as Delusion (Ecstasy) Lake, is a recently formed glacial system that supported no documented salmon run prior to the mid 1980's. The sockeye run to this system showed a peak aerial escapement estimate of 1,100 sockeye salmon in 2005.

Similar to the 2004 season, targeted fishing effort was allowed on sockeye salmon returning to Chenik Lake in the Kamishak Bay District for only the second time since 1993. From 1994 through 2002, returns to that system had been poor due to the after-effects of an outbreak of IHNV, a naturally occurring viral disease, in the early 1990's. The outbreak caused increased mortality to young salmon, subsequently resulting in weak adult returns, and CIAA ultimately

suspended the stocking program at Chenik Lake after the 1996 season. The sockeye run to Chenik this year, the third consecutive good run, was easily the strongest since 1993, with a total estimate of over 60,000 sockeye salmon, consisting of a commercial seine harvest of 47,000 fish and an approximate escapement of 14,500 (Appendix A16), surpassing the escapement goal range of 2,000 to 9,300. It is important to note that all adults returning to Chenik Lake in 2005 were the result of natural production since the stocking program has not been conducted at this system since 1996.

Waters of Aialik Bay in the Eastern District were opened to commercial fishing in mid-July of 2005 after verification that the Aialik Lake sockeye salmon SEG had been achieved, but by that time the majority of fish had apparently entered the system and only minimal effort and harvest resulted. The final estimate of escapement at Aialik Lake based on aerial surveys was just under 5,300 fish, falling within the SEG range of 3,700 to 8,000 sockeye (Table 3; Appendix A23). At Mikfik Lake in the Kamishak Bay District, a relatively weak run resulted in an escapement estimated at around 6,000 sockeye (Table 3; Appendix A23), which was about 300 fish short of the established goal. No seine effort targeting Mikfik sockeye salmon occurred despite continuous fishing time allowed in June.

Coho Salmon

The coho salmon *O. kisutch* resource in the LCI management area is not extensive, therefore this species rarely attains commercial prominence. The 2005 commercial harvest of 9,100 coho salmon (Table 4) was the lowest LCI total for this species since 2002 and only about 80% of the average catch during the past 10 years (Appendix A17). As is typical in most years, the greatest proportion of the LCI coho harvests resulted from a combination of hatchery cost recovery operations at Bear Lake (17%) and entries into the Seward Silver Salmon Derby (52%), both in Resurrection Bay of the Eastern District. It should be noted that the organizer of the derby, the city of Seward, annually sells the derby entries to a commercial processor as a means to generate revenue, hence these derby entries are listed as "commercial" harvests. The remainder of the LCI coho catch was split between set gillnetters (21%) and seiners (9%) in the Southern District, while seiners in the Kamishak Bay and Outer Districts caught negligible numbers. Because the coho resource in LCI, and assessment of it, is limited, commercial coho harvests can sometimes be used to gauge coho run strength. However, market conditions in recent years have discouraged directed effort, making the incidental commercial harvest of this species an unreliable indicator. Sport and personal use harvests generally provide the best indicators of run strength. The relatively weak commercial catches, and other informal signs, suggested that returns during 2005 were likely average or slightly below average. The single aerial survey flown specifically for coho salmon assessment at Clearwater Slough in the Northshore Subdistrict of the Southern District resulted in a peak daily index count of 700 coho recorded on September 2 and was considered good by historical standards.

Pink Salmon

Returns of pink salmon, usually the dominant species in numbers of commercially harvested salmon in LCI, were considered generally good this year, with an overall harvest of over 2.3 million fish (Table 5; Figure 11). This number represents the second highest commercial catch since 1997 and the fourth highest over the past 20 years (Appendix A18). However, harvests this season were comprised mainly of fish returning to the two major hatchery facilities in LCI and were used primarily for hatchery cost recovery purposes. Although numerous natural pink

salmon returns were sufficient to allow liberal fishing periods, the low availability of buyers and tender service combined to keep harvests comparatively low.

The majority of the pink salmon catch this season was taken in the Southern District (Table 5; Appendix A18) as a direct result of Tutka and Port Graham Hatcheries' production, but the vast majority of this district's total was utilized for hatchery cost recovery (Tables 1, 5, and 9). The estimated overall Tutka Hatchery return, including escapement into Tutka Creek, hatchery harvest, commercially harvested fish, and sport harvest, was around 1.77 million pink salmon (Table 9), substantially exceeding the preseason projection of 1.02 million fish. The 2005 estimated survival rate of approximately 3.7% was considerably higher than the long-term average of just over 2% for the facility. As stated previously, because CIAA suspended operations at Tutka Hatchery at the conclusion of the 2004 season, no broodstock was collected in 2004 or 2005. At Port Graham Hatchery, the pink salmon return was weaker than expected, with an overall return estimate of about 600,000 fish, with approximately 85% taken for hatchery cost recovery and an additional 84,000 pinks (14%), harvested for hatchery broodstock purposes (Table 5).

The Outer District produced the greatest contribution of naturally produced pink salmon to LCI catches, with a total harvest of approximately 110,000 fish (Table 5; Appendix A18). The majority of the Outer District harvest was taken in Port Dick Subdistrict, with lesser amounts coming from Windy and Rocky Bays. In the Kamishak Bay District on the west side of LCI, the paltry pink salmon harvest of 7,800 fish (Table 5; Appendix A18) all came as incidental catch during directed efforts targeting chum salmon in the northern half of the district. Pink salmon escapements to all systems within the management area were sufficient to achieve SEGs (Appendix A24).

Chum Salmon

The 2005 commercial chum salmon harvest of nearly 100,000 fish (Table 6), which was more than double the recent 10-year average (Figure 12; Appendix A21), was the second highest catch for this species since 1988, maintaining a 6-year trend of good catches for this species in LCI. The harvest was not surprising based on the recent pattern of comparatively strong returns and concurrently good escapements, especially to systems in Kamishak Bay. Almost all the Kamishak District harvest, totaling 84,000 chum salmon this season, was taken in the northern end of the district by effort targeting another exceptional Cottonwood Creek run. Nearly all chum systems in the management area achieved their SEGs as a result of the reasonable runs, including McNeil River in the Kamishak Bay District, which fell within its chum salmon SEG range for only the fourth time in the past 16 years (Appendix A25).

2005 EXVESSEL VALUE

The estimated exvessel value of the 2005 commercial salmon harvest in LCI, not including any postseason adjustments in price paid to fishermen, was approximately $1.63 million (Table 7; Appendix A2), making it the fourth lowest during the past decade. Purse seine gear in the common property fishery, which normally accounts for the majority of the catch and value, accounted for just over $738,000 or 45% of the overall exvessel total (Table 7), while set gillnets accounted for $138,000 or 9%. An estimated $733,000, or about 45% of the entire exvessel value of the LCI salmon fishery, was utilized for hatchery cost recovery purposes, while the remaining 1% consisted of coho entered into the Seward Silver Salmon Derby and subsequently sold by organizers of that event. Estimated average prices paid to fishermen in 2005, not including any

postseason adjustments, were as follows: Chinook–$1.54/pound; sockeye–$0.86/pound; coho-$0.53/pound; pink–$0.07/pound; and chum–$0.23/pound (Table 10; Appendix A3). Prices for all species except Chinook increased over the previous season.

2005 DISTRICT INSEASON MANAGEMENT SUMMARIES

Southern District

Set Gillnet Fishery

An Area H commercial set gillnet permit is valid for fishing in any part of Cook Inlet (Upper or Lower), but there are only five beach areas in LCI, all located along the south shore of Kachemak Bay in the Southern District, where set gillnets may be used during open fishing periods (Figure 2). The limited area provides only enough productive fishing sites to accommodate approximately 25 set net permits.

The 2005 LCI all-species set gillnet harvest totaled just under 20,000 fish, representing less than 30% of the recent 10-year average (Appendix A7) and a second consecutive exceptionally poor all-species total for this gear group. The sockeye catch of almost 16,000 fish was the lowest since 1994 and was less than 40% of the average over the past decade. For comparison, species composition in 2005, with sockeye at 79% and pink salmon at 2%, was considerably different than the average over the past decade, when typical species composition in the commercial set gillnet fishery was 59% sockeye, 30% pink, 6% chum, 3% coho, and 2% Chinook. The catch of Chinook salmon, at only 525 fish, was far less than the recent 10-year average of 1,200 and was the lowest harvest since the early 1980's. Enhancement efforts, directed primarily at recreational fisheries in Halibut Cove Lagoon and secondarily in Seldovia Bay, were predominantly responsible for the commercial set gillnet Chinook catch during 2005.

Based on the weak preseason forecast for sockeye salmon returning to English Bay Lakes, the commercial set gillnet fishery in the Port Graham Subdistrict, including both the English Bay and Port Graham Sections, was kept closed for the entire season to protect fish for escapement, and therefore no harvest was recorded in the commercial fishery. The run proved only marginally stronger than anticipated, and once achievement of the SEG could be projected, subsistence-only set gillnetting in waters of Port Graham Subdistrict was opened near the end of June. The low end of the desired inriver goal of 7,300 to 15,000 sockeye was slightly exceeded (Appendix A23), while local fishermen from the villages of Nanwalek and Port Graham caught an undetermined number of sockeye for subsistence needs. This situation was similar to the 2000, 2001, and 2004 seasons, when complete fishing closures or severe restrictions were implemented due to weak sockeye returns.

After the English Bay Lakes sockeye return was over, waters of Port Graham Subdistrict did not reopen to commercial set gillnet fishing since the Port Graham Hatchery pink salmon forecast suggested that all returning fish would be required to meet hatchery cost recovery and broodstock requirements. The hatchery return proved weaker than predicted, and the pink salmon cost recovery, broodstock, and egg take goals for Port Graham Hatchery were not met. Escapement of pink salmon into Port Graham River was the highest on record, exceeding the SEG for that system by a substantial margin (Appendix A24).

LCI set gillnet fishing effort in 2005 was down for the second consecutive year with a total of 17 permits actively fished. This figure was the lowest since 1994 and also less than both the 10- and 20-year averages (Appendix A1).

Seine Fishery

Sockeye Salmon

The overall catch of sockeye salmon by all gear types in the Southern District, at 111,000 fish, was the second lowest for this species since 1994 (Appendix A13) and was less than half of the recent 10-year average. Purse seiners in the common property fishery accounted for about 59% of the sockeye salmon landed in the district in 2005, or approximately 65,000 fish, while an additional 30,000 sockeye (27%) were harvested by purse seine for hatchery cost recovery (Table 1). The relatively poor sockeye catch in 2005 comes on the heels of a dismal sockeye harvest in 2004 totaling less than 51,000 fish for all gear types. Low catches during the past two seasons may be at least partially attributed to low stocking levels in the Leisure/Hazel Lakes systems during 2001, while poorer than average survival rates may potentially have contributed as well.

Similar to recent years, waters of Halibut Cove Subdistrict, as well as the outer waters of China Poot Bay and Tutka Bay Subdistricts, were opened to seining 5 days per week beginning Monday, June 20, to target enhanced sockeye runs to Leisure and Hazel Lakes. Within these subdistricts, however, waters of the China Poot and Hazel Lake Special Harvest Areas (SHAs; Figure 3) were opened only to authorized agents of CIAA at this time, 7 days per week, for the express purpose of hatchery cost recovery. Traditionally, the SHAs remain closed to the common property commercial fishery until the preseason revenue goal established for each SHA is achieved.

Preseason combined harvest projections for sockeye runs to the Leisure and Hazel Lakes' stocking sites were estimated at nearly 114,000 fish. The actual commercial harvest of adult fish produced as a result of the two enhancement projects was estimated at around 95,000 fish (Figure 10; Appendix A15), comprising just over one-third of the entire LCI sockeye salmon harvest (Table 3). Because of the close geographic proximity of these two projects, the overlapping area of harvest, and the lack of tagging, no definitive assessment of separate runs to each system can be established. However, fish returning as a result of these two projects not only contributed to seine catches in China Poot Subdistrict but also to those in adjacent Halibut Cove and Tutka Bay Subdistricts. It was estimated that personal use dip net and sport fishermen harvested another 5,500 sockeye salmon at the head of China Poot Bay based on average catches from the early 1990's. The 2005 total cumulative run from both projects was estimated at slightly less than 101,000 sockeye (Appendix A15), making it only about two-thirds of the average combined run of sockeye salmon to the two systems since adults began returning to Hazel Lake in 1991.

As outlined in the Trail Lakes Hatchery Annual Management Plan (AMP) prior to the season, the CIAA revenue goal necessary to meet operational expenses incurred in LCI sockeye salmon lake stocking projects was set at $120,000 this year. This figure was to be split amongst locations as follows: 78% from combined China Poot and Hazel Lake SHAs, both in the Southern District, and 22% from the Kirschner Lake SHA in the Kamishak Bay District. Cost recovery harvests inside the China Poot and Hazel Lake SHAs (Figure 3) were to proceed at CIAA's discretion as early as possible in the runs since harvests could take place without interference or competition from the fleet at large. A minimum harvest of 39,200 sockeye from the China Poot and Hazel Lake SHAs was necessary to achieve the combined goal of $93,600 for these two areas, assuming a preseason average price of $0.60 per pound and an average weight of 4.0 pounds per

fish. As previously described, these SHAs were to remain closed to common property seining until the combined goal established for the two areas was achieved.

Similar to 2003 and years prior to 2001, CIAA contracted the Cook Inlet Seiners Association (CISA) to undertake sockeye cost recovery in LCI, with the latter organization relying on the use of volunteer vessels to undertake hatchery harvest in 2005. This differed from the 2001, 2002, and 2004 seasons, when CIAA contracted several individual LCI seiners to conduct cost recovery within the Southern District SHAs. The first hatchery harvest in the China Poot Subdistrict occurred on June 26 in the China Poot SHA, netting about 1,000 fish, which was considered relatively early by historical standards and suggested that the return might be at least as strong as forecasted. Up until that time, vessels participating in the common property fishery outside the SHAs were experiencing modest but increasing catches, reporting that numbers of fish present in area waters were steadily improving.

As sockeye continued to build within the China Poot and Hazel Lake SHAs, hatchery harvests continued. In addition, a retroactive price change, announced in early July, increased the inseason contract price of cost recovery sockeye to $0.72 per pound, thus reducing the necessary number of fish to 32,500 in order to achieve the hatchery revenue goal. Between June 26 and July 15, a total of 13 hatchery deliveries were reported from the China Poot SHA, while an additional five occurred in the Neptune Bay SHA between June 30 and July 11. The peak hatchery harvests of the season occurred between July 7 and July 11 when nearly 8,400 fish were taken in the China Poot SHA, with an additional 1,800 fish reported from the Hazel Lake SHA during this time. The final hatchery harvest of the season came on July 15, bringing the cumulative reported catch in the China Poot and Hazel Lakes SHAs to 29,700 sockeye salmon, totaling nearly 128,000 pounds. These figures translated into just over $92,000 revenue for the season, effectively achieving the goal established for the Southern District SHAs. As a result, the China Poot and Hazel Lakes SHAs were closed to cost recovery harvest on the afternoon of July 15, and waters of both the China Poot and Hazel Lake Sections of China Poot Subdistrict were opened to common property seining 7 days per week beginning the next morning. A small portion of the China Poot Section near the mouth of China Poot Creek remained closed to commercial fishing on weekends in deference to the heavy sport/personal use traffic in the vicinity.

As mentioned earlier, common property seine catches in China Poot Subdistrict, outside of the SHAs, showed reasonably good strength during late June, providing justification for an optimistic outlook. Catches appeared to peak during the first 7 days of July in both sections, cumulatively averaging over 4,400 sockeye per day fished, although a “spike” in the daily catches of both sections occurred just over a week later. Steady fishing effort, combined with no significant individual daily buildup of fish, kept catches from showing any single outstanding harvest date during the month of July. Catch rates in the Hazel Lake Section dropped dramatically after July 16, while those in the China Poot Section followed suit after July 19. The final landing came on July 31, bringing the cumulative commercial catch in the two sections to nearly 61,000 sockeye (Table 3) taken by 23 seiners. Approximately two-thirds of this harvest, or about 40,300 sockeye, was taken in the China Poot Section, suggesting that the Leisure Lake sockeye return was, not surprisingly, stronger than the Hazel Lake return.

Very little seine effort for sockeye salmon occurred within adjacent waters of Tutka Bay Subdistrict to the southwest of the China Poot Subdistrict, resulting in an additional harvest of

less than 400 fish. However, seiners fishing in Halibut Cove Subdistrict to the northeast caught an additional 3,900 sockeye (Table 3).

Pink Salmon

Returns of pink salmon to the Tutka Bay and Port Graham Hatcheries contributed to an overall (all gear types) Southern District harvest of nearly 2.18 million fish (Table 5; Appendix A18), approximately 60% greater than the recent 10-year average and considerably larger than the preseason hatchery-only harvest forecast of 1.7 million fish. Of the pink harvest in the district, seiners in the common property fishery took only around 1% of the total, while hatchery cost recovery accounted for the remainder.

Waters of Tutka Bay Subdistrict outside of Tutka Bay proper first opened to commercial seining 5 days per week beginning June 20, as has been the case in recent years. The open waters consisted of those waters offshore of a line running from the "rock quarry" on the north shore of Tutka Bay to the Tutka Bay Lodge on the south shore (Figure 4). Waters within the Tutka Bay SHA (Figure 4) were open only to hatchery cost recovery harvest by authorized agents of CIAA on a continuous basis, as established in the Tutka Hatchery Annual Management Plan (AMP), beginning June 20. Since CIAA had announced a suspension of operations at Tutka Hatchery, no broodstock were to be collected in 2005, thus all fish excess to natural escapement requirements were slated for cost recovery harvest to help offset operational expenses. Also, because Tutka Hatchery had been operating at a deficit for a number of years, the revenue goal for the season was set at $888,000 for FY05, meaning that all fish returning to the hatchery would be required for this purpose. A range of 12,000–19,000 pink salmon was needed to meet the sustainable escapement goal established for Tutka Creek. If achievement of the aforementioned goals could not be projected by July 5, a certainty based on the forecast, additional common property fishery restrictions within Tutka Bay Subdistrict would be implemented as outlined in the Tutka Hatchery AMP.

The contracted hatchery cost recovery vessels and crews were available and ready to begin fishing in early July, with the first harvest occurring on July 3. Up to three cost recovery vessels were employed again this season, and the hatchery harvest strategy was designed to encourage as much fishing outside of Tutka Lagoon as possible in order to promote product quality and reduce the logistical difficulties of moving tender vessels through waters of the shallow access channel connecting the lagoon to Tutka Bay proper. Day to day operations of the catcher boats and tenders were adjusted depending on fish returns, tides, and weather.

Initial cost recovery catches were very strong, averaging over 100,000 pink salmon per day during the first 2 days of active harvest, suggesting that the hatchery return was either early or much stronger than predicted. As expected, no common property effort directed at Tutka pink salmon had yet occurred, and attainment of hatchery goals could not be projected by July 4. As a result, the common property seine closure line in Tutka Bay Subdistrict was moved seaward beginning July 5 to discourage potential effort on this stock and allow as many fish as possible to reach waters near the facility.

Pink salmon run entry into Tutka Bay and, more particularly into Tutka Lagoon, was exceptional, and hatchery catcher vessels struggled to keep up with the large numbers of fish steadily entering area waters. It should be noted, however, that tender availability throughout the return was not as consistent as would be appropriate for a return of this magnitude. As always, the size of daily tides contributed to the difficult logistics of removing fish from Tutka Lagoon

due to the shallow access channel. Hatchery fishing continued through the month of July and into early August, and once it became clear that hatchery efforts would not complete the harvest by the target shutdown date of August 6, hatchery fishing was extended after that date so that hatchery fishing could continue in waters of the SHA. The hatchery cost recovery vessels reported deliveries on a total of 23 days between July 3 and August 13. Two peak daily cost recovery harvests of the season occurred on July 8 and 20, with approximately 160,000 pink salmon taken on each day, while daily catches averaged about 71,000 pinks for each day fished during the season. Pink salmon harvested for cost recovery averaged almost 3.5 pounds per fish, considerably greater than the expected average weight of 2.88 pounds. The cumulative hatchery cost recovery catch totaled 1.632 million pinks for the season (Table 9). The overall value of the harvest was only about $146,000 (Table 7), substantially short of the revenue goal of $888,000. Again, no fish were collected for hatchery broodstock.

Despite the weak markets and low price for pink salmon, a few seiners expressed interest in targeting pink salmon returning to Tutka Hatchery due to the large volume. Seining in offshore waters of Tutka Subdistrict had been open since late June to allow opportunity to harvest sockeye salmon destined for Leisure and Hazel Lakes, and incidental catch of pink salmon, presumably of Tutka origin, had been relatively high. Because historical run timing information suggested that the majority of pink salmon destined for the hatchery facility had already arrived there by August 6, waters of Tutka Bay Subdistrict northwest of the powerline crossing were opened to commercial seining beginning August 8 on a schedule of 5 days per week. Normally the marine waters of Tutka Bay between the powerline crossing and the “offshore” Tutka seine closure line are kept closed to all fishing, but the strong return of pink salmon in 2005 warranted an opening in these waters. Common property seine effort after the August opening in Tutka Bay was light and harvest minimal, resulting in an overall seine catch totaling about 4,800 pink salmon in Tutka Bay Subdistrict for the entire season. The estimated pink salmon escapement of nearly 134,000 fish into Tutka Creek (Table 5; Appendix A24) set a new all-time record for this small system, brought about by the unexpectedly strong return to the hatchery. The total return of pinks to Tutka Hatchery, including commercial, cost recovery, and sport harvest, as well as escapement, was estimated at 1.77 million fish (Table 9), exceeding the preseason forecast by almost 75%. It should be noted that the sustained strength of the Tutka Hatchery pink salmon return in 2005, and the inability of hatchery catcher vessels to maintain an adequate harvest rate, resulted in an unquantifiable but likely significant number of unharvested fish this season.

At Port Graham in the Southern District, a spring 2004 fry release of about 36.2 million pink salmon from Port Graham Hatchery was expected to produce an adult return with a midpoint of about 834,000 fish this season. With a hatchery broodstock goal of 191,000 fish, the Port Graham Hatchery Corporation (PGHC) anticipated a harvestable surplus of approximately 643,000 pink salmon. Using an average weight of 3.2 pounds per fish and an average midpoint price of $0.09 per pound, harvest of all available fish would likely be necessary in pursuit of the established hatchery revenue goal of $400,000. Thus, no directed common property effort or harvest was expected.

Since the Port Graham Hatchery pink salmon broodstock goal of 191,000 fish (of hatchery origin) seemed attainable based on the forecast, the capture of wild stock fish near the mouth of or within nearby Port Graham River, for use as hatchery broodstock, would not be necessary. Nonetheless, a hatchery egg removal schedule for Port Graham River was summarized in the AMP as a contingency. The forecast for the wild stock return to Port Graham River was

estimated at approximately 22,000 pinks, slightly exceeding the SEG range of 7,000 to 20,000 fish. Recognizing that the forecasts for both the hatchery and wild stock pink salmon returns to Port Graham suggested that those entire returns would likely be required to fulfill escapement, broodstock, and cost recovery requirements, the staff elected to leave the commercial set gillnet fishery in waters of Port Graham closed to protect returning pink salmon. This fishery had originally been closed since early June to protect sockeye returning to nearby English Bay Lakes for escapement purposes.

The first ground survey of Port Graham River confirming the presence of pink salmon was completed on July 11, but counts numbered less than 10 fish, not a surprising figure based on historical run timing information for this early date. An ADF&G aerial survey near the end of July estimated 11,000 fish in fresh waters of Port Graham River, falling within the SEG for this system. Additionally, significant numbers of pink salmon were also seen staging in marine waters adjacent to the hatchery net pens, located at the source of fresh water for imprinting purposes, and near Duncan Slough, adjacent to the hatchery facility. Such observations annually imply that these fish are primarily of hatchery origin. In order to allow PGHC to initiate cost recovery operations and broodstock collection, waters of the Port Graham SHA (Figure 6) east of the U.S. Coast Guard navigational buoy were opened to harvest by authorized agents of PGHC on a continuous basis beginning July 29. Restricting PGHC to this relatively small area was felt to provide sufficient protection to natural-stock fish bound for Port Graham River while still allowing the hatchery opportunity to pursue its objectives. Further manipulation of time and area within the SHA would be considered in order to secure escapement and/or hatchery requirements.

Hatchery cost recovery efforts in the Port Graham SHA began on August 5 with a catch of 23,000 pink salmon. Harvests continued on an almost daily basis through the month of August and into early September, with the final harvest occurring on September 6. Catcher vessels averaged slightly more than 28,000 pinks reported per day actively fished during the month, while the peak daily catch occurred early in the return when just over 61,000 pink salmon were taken on August 6. The overall cost recovery harvest of pink salmon by Port Graham Hatchery totaled 511,000 fish, worth an estimated $146,000 or about 37% of the established revenue goal. Broodstock efforts netted an additional 84,000 fish (Table 5), bringing the cumulative pink salmon return to Port Graham Hatchery to approximately 595,000 fish, or only about 70% of the preseason forecast. An additional 5,000 pink salmon, believed to be of hatchery origin, were estimated by hatchery personnel as escapement into tiny Duncan Slough, located very near the hatchery facility. The final escapement into Port Graham River, estimated at 69,000 pinks (Table 5; Appendix A24), was more than three times the upper end of the established SEG range. The commercial set gillnet fishery in Port Graham Subdistrict remained closed to fishing for the duration of the pink salmon return, thus no common property harvest resulted.

Returns of wild pink salmon stocks to other systems in the Southern District, as indicated by ground survey escapement counts, were excellent. For the first time in many seasons, seine openings directed at wild stock pink salmon were allowed in the Southern District at Humpy Creek and Seldovia Subdistricts. Resulting harvests were negligible, and pink escapements into all Southern District systems exceeded their established SEG ranges (Table 5; Appendix A24).

Other Species

The Southern District chum salmon harvest in 2005 cumulatively totaled 1,750 fish for all gear types, the third lowest total on record for the district (Table 6; Appendix A21). Seiners took only

about a quarter of the total, with set gillnetters accounting for the remainder. Catches from Tutka Bay Subdistrict dominated the all-gear-types totals (Table 6) at about 45% of the district-wide harvest, but seine catches of chum were highest in the Neptune and China Poot Sections of China Poot Subdistrict, undoubtedly as incidental catch during efforts targeting sockeye returning to those two stocking sites. Escapements into Southern District chum systems were generally poor, and an escapement within the SEG range was not achieved at Port Graham River (Appendix A25) for the second consecutive year. Seldovia River, with no formal SEG, experienced the weakest chum return in many seasons, with a final escapement totaling a paltry 1,500 fish.

Although minor in total numbers of fish, the majority of the Southern District Chinook harvest usually consists of incidental catches of adult fish returning to two of three separate enhancement projects. The 2005 Southern District harvest of 621 Chinook salmon by all gear types was the lowest since 1980, representing only about 44% of the recent 10-year average of 1,410 fish (Appendix A12). Seiners took approximately 15% of the Southern District Chinook total this season, estimated to be near the normal proportion for this gear type, with set gillnetters harvesting the remainder. The district-wide coho salmon catch of 2,700 fish by all gear types was higher than the previous season but only about 69% of the recent 10-year average (Appendix A17), with seiners accounting for approximately 30% of the total and set gillnetters taking the rest (Table 1).

Kamishak Bay District

Sockeye Salmon

The entire Kamishak Bay District, with the exception of Chenik Subdistrict, opened to salmon seining by regulation on June 1. For the sixth consecutive year, waters of Paint River Subdistrict were included in this district-wide opening because the stocking program at Paint River Lakes has been discontinued (except for an experimental, one time stocking in 2002), and once again few if any sockeye were expected back to that location this season. The weekly fishing schedule for open waters within the district was set at 7 days per week for the seventh successive year. This schedule was originally implemented because the complexion of the fishery had evolved since 1994, when fish processors ended the routine practice of stationing a tender(s) in this remote district at the start of each season. As a result, effort and ensuing catches declined as fishermen were forced to devise their own transport of all salmon harvested. Recognizing this shift in effort levels, as well as the harsh weather that typically limits effective fishing activity, the staff reasoned that opening waters of Kamishak Bay District to commercial seine fishing 7 days per week would allow opportunity to harvest salmon without unduly jeopardizing spawning escapement requirements.

The earliest natural sockeye salmon run to the management area, at Mikfik Creek in the McNeil River Subdistrict, displayed relatively normal run timing characteristics, with the first fish of the season observed via aerial survey on June 6. At 1,300 fish, this first indication suggested that the run was moderate. Numbers built over the next week, with about 5,100 sockeye salmon estimated in fresh water on June 13, which ultimately proved to be the peak daily survey estimate of the season. Despite the continuous fishing time allowed in McNeil River Subdistrict, no effort directed at Mikfik sockeye occurred this season and therefore no harvest was recorded. Although no increase in cumulative escapement was detected after the June 13 survey, a group of sockeye numbering about 900 fish was observed in McNeil Lagoon on the historically late date

of August 4. The staff believed that the time separation between the peak daily survey estimate in early June and the August observation indicated that the latter observation was composed of entirely different fish that had not been accounted for in the earlier survey. As a result, the 900 sockeye observed in August were combined with the peak daily estimate to arrive at a final estimated sockeye escapement index of 5,970 (Table 3; Appendix A23), failing to achieve the low end of the established SEG of 6,300 to 12,150 fish by about 330 fish.

After the Mikfik sockeye run, seiners would next normally turn their attention to the Chenik and/or Douglas River Subdistricts during the final days of June. Although the stocking program at Chenik Lake had been suspended, and sockeye returns to the system had been minimal in the late 1990's and early 2000's due to the lingering effects of an IHNV outbreak in previous years, surprisingly strong returns in both 2003 and 2004 created considerable optimism for 2005. Aerial surveys began to detect fish in salt waters of Chenik Lagoon on June 16 with an estimate of 500 sockeye salmon. Little increase was observed during the next survey on June 21, but on June 24 the estimated figure had jumped to 2,500 sockeye in salt water. Historical run timing for the Chenik sockeye stock indicated that the run was in its earliest stages, thus suggesting a run strength sufficient enough to sustain commercial exploitation without jeopardizing escapement. As a result, waters of Chenik Subdistrict south of 59° 16′ N. latitude were opened to seining 5 days per week beginning June 29; seining north of this line was kept closed to protect sockeye salmon returning to small Amakdedori Creek, where escapement was not strong. The typically harsh weather conditions in Kamishak Bay, as well as marker placement around the mouth of Chenik Lake Creek, were expected to limit fishing activity and allow adequate numbers of fish into fresh water for escapement. In a departure from recent years when all escapement assessment at Chenik Lake was conducted by aerial survey, CIAA funded and operated a counting weir at the outlet of Chenik Lake beginning on July 1.

Catches in Chenik Subdistrict during the first days after the opening were strong, cumulatively totaling over 8,400 sockeye for the first deliveries on June 30. Several days later in early July, the cumulative harvest had risen to over 13,000 sockeye in Chenik Subdistrict, but escapement at the time was sluggish. The relatively modest high tides around this time, combined with brown bear fishing activity for salmon at the creek mouth, seemed to discourage fish from attempting to ascend the small set of "step" falls at tidewater. As a result, less than 25 fish had been documented as escapement at the weir through July 5. Additionally, a series of exceptionally low tides was approaching, which could leave fish vulnerable to harvest by forcing them out from waters protected by regulatory markers. Finally, the notoriously harsh weather in Kamishak Bay, which was expected to limit fishing activity, had been uncharacteristically mild, with a short-term forecast predicting similar weather. Therefore, in an effort to protect fish for escapement, waters of Chenik Subdistrict were closed to seining beginning July 6.

On July 10, a small spike in escapement was documented by the Chenik Creek weir, and by mid-day July 11, cumulative counts had achieved the low end of SEG range for the system. Additionally, a large buildup of sockeye estimated by an ADF&G aerial survey at around 10,000 fish was protected by regulatory markers in Chenik Lagoon. As a result, the seine fishery in Chenik Subdistrict south of Amakdedori Creek was reopened on a 5 days per week basis beginning July 13 to allow seiners opportunity to harvest surplus fish while still allowing for limited escapement over the duration of the return.

Initial catches in Chenik Subdistrict after it reopened were unexpectedly weak, cumulatively totaling less than 300 sockeye salmon. Unfortunately, sockeye in salt water inexplicably failed to

ascend to Chenik Lake in the ensuing 2 days after the opening, with a cumulative escapement of less than 200 fish tallied by the counting weir during that time frame. An ADF&G aerial survey on July 15 showed that few new fish were contributing to the concentration of fish in salt water, estimated at 11,000 fish during that survey. A series of large minus tides during the next week was expected to force most if not all sockeye protected by markers into areas open to salmon fishing, making them vulnerable to harvest and therefore jeopardizing escapement objectives. As a result, waters of Chenik Subdistrict were once again closed to commercial salmon seining beginning July 16 to protect sockeye salmon bound for Chenik Lake until an escapement near the upper end of the SEG could be achieved or projected.

Sockeye finally began moving into fresh water on July 17, and by July 19 the cumulative weir count had risen to over 7,800 fish. Since this figure was near the upper end of the SEG for Chenik Lake, waters of Chenik Subdistrict south of Amakdedori Creek were reopened to fishing 7 days per week beginning July 21. In addition, regulatory markers protecting the mouth of Chenik Lake Creek at tideline were repealed, and fishing was allowed on a continuous basis inside Chenik Lagoon. Seiners quickly took advantage of the liberalized opening and harvested much of the available surplus. Sporadic effort occurred after this time, and the last reported delivery of Chenik sockeye salmon was made on August 5, bringing the cumulative harvest for the season to 47,000 fish (Table 3). Although the weir at Chenik Lake was removed on August 4 after a cumulative count of nearly 13,000 sockeye, an ADF&G remote video escapement recorder (RVER) at the site documented an additional escapement of 1,700 sockeye into the lake after that date. The final escapement at Chenik Lake was estimated at 14,500 sockeye (Table 3; Appendix A23), representing the second highest escapement estimate for Chenik Lake since 1990 and, when combined with the commercial catch, the largest overall return of sockeye to the Chenik Lake system since 1991 (Appendix A16).

Only minimal effort directed at sockeye salmon occurred in the Douglas River (Silver Beach) Subdistrict between mid-June and the first week of July, resulting in a cumulative harvest of 2,900 fish (Table 3). Apparently the low numbers discouraged any further effort in this subdistrict during 2005.

The next sockeye run in Kamishak Bay District was to Kirschner Lake in the Bruin Bay Subdistrict, the site of a traditional sockeye salmon lake stocking project. At Kirschner Lake, where a steep falls at tide line precludes escapement into the lake, a run of 24,000 sockeye was predicted. As outlined in the Trail Lakes Hatchery Annual Management Plan (AMP) prior to the season, the revenue goal necessary to meet operational expenses incurred in all LCI sockeye salmon lake stocking projects was set at $120,000. This amount was to be split between the Southern District SHAs (Leisure/Hazel Lakes; Figure 3) at 78% of the total and the Kamishak SHA (Kirschner Lake; Figure 5) at 22%, or $26,400. Because CIAA anticipated harvesting the entire return of sockeye to Kirschner Lake for cost recovery purposes in pursuit of the cost recovery goal, no directed common property effort on this stock was expected.

Preseason management strategy for the Bruin Bay Subdistrict, as outlined in the Trail Lakes Hatchery AMP, was to open the Kirschner SHA to hatchery cost recovery fishing on a continuous basis beginning June 20 while simultaneously closing it to common property seining. The intent was to allow opportunity for CIAA to harvest fish for cost recovery without competition from the seine fleet. If the goal was met or could be projected, the SHA was to be closed to cost recovery harvest and opened to commercial seining so the fleet could work the area uninhibited for the remainder of the season.

CIAA had arranged prior to the season for a CISA vessel to conduct cost recovery in Kamishak Bay. Initiation of cost recovery fishing generally requires a substantial buildup of fish in salt water near the Kirschner falls, and 2005 was no exception. The first effort occurred in the Kirschner Lake SHA on July 9, netting an estimated harvest of 9,000 fish. Because the inseason contract price for Kirschner sockeye, at $0.55 per pound, was over twice the preseason projection, attainment of the revenue goal became a distinct possibility if the return came in as forecasted. Unfortunately, this did not prove to be the case, and only one more cost recovery harvest occurred, on July 15, bringing the cumulative catch for the season to just under 15,000 sockeye (Table 3) with an estimated value of around $33,000, slightly exceeding the revenue goal. The total return to Kirschner Lake was estimated at around 16,500 sockeye salmon (including unharvested fish), or only two-thirds of the preseason prediction for the system. Despite this shortfall, the Kirschner Lake sockeye enhancement project has remained one of LCI's steadiest producers.

Pink Salmon

Preseason pink salmon projections for the Kamishak Bay District in 2004 were quite positive, with a cumulative harvestable surplus totaling 700,000 fish forecasted for Ursus Cove, Rocky Cove, and Bruin Bay Subdistricts. Aerial surveys of the district began to document pink salmon in fresh water during the middle part of July, but those early estimates suggested that the forecast appeared overly optimistic. As surveys continued through the remainder of the month and into August, observations revealed that pink returns were strong enough to achieve SEGs while providing only moderate harvest opportunities.

Despite continuous openings in the vicinity of major pink salmon systems, the combination of weak markets and a lack of tender service discouraged directed effort on Kamishak Bay pink salmon in 2005. The cumulative pink harvest for the season, totaling 7,800 fish (Table 5; Appendix A18), came primarily as incidental catch during effort directed at the strong chum salmon returns to Kamishak Bay. Escapement at one of the three major monitored pink systems in the district, Bruin Bay River, fell near the upper end of its SEG range (Table 5; Appendix A24), while final pink salmon indices of escapement at Sunday Creek and Brown's Peak Creek slightly exceeded the upper ends of their SEG ranges.

Chum Salmon

For the sixth consecutive season, significant effort directed at strong chum salmon runs resulted in outstanding catches in the LCI management area. The final overall LCI catch of chum salmon totaled almost 99,000 fish, with seiners in Kamishak Bay District taking 85% of the total (Table 6; Appendix A21). The 2005 commercial chum harvest of nearly 84,000 fish in Kamishak Bay District was the third highest since 1988. Chum escapements throughout the district were once again generally strong, including McNeil River, where the escapement fell within the goal range for only the fourth time in the past 16 years.

Aerial surveys to monitor chum returns in Kamishak Bay began in mid/late June, with the first chum salmon of the season noted in McNeil River on June 21, considered relatively early by historical standards although numbers were modest. Because chum runs to McNeil River have not been strong over the past decade, waters of McNeil River Subdistrict were closed to commercial fishing as a precaution beginning June 24, even though no seiners were present in area waters. Escapement into McNeil River spiked during the first week of July but then remained relatively static for the remainder of the season. A daily aerial estimate of 11,100 chum

salmon on July 5 ultimately proved to be the season's peak. Postseason analysis of aerial survey data using the standard area under the curve (AUC) method yielded a final estimated escapement index at McNeil River of 17,400 fish, falling within the SEG range of 13,800 to 25,800 and the second largest escapement since 2000 (Appendix A25).

Chum runs to nearly all other Kamishak Bay systems were strong. After five consecutive seasons of impressive chum returns, LCI seiners expected a continuation of the trend in 2005. In the southern portion of the district, which had been opened to fishing 7 days per week at the beginning of the season, aerial surveys indicated that chum runs to the Big and Little Kamishak Rivers were reasonably strong, though surpluses were not likely great. Limited effort early in the returns convinced seiners that further effort was not warranted, therefore only minor harvests resulted. The final escapement estimate of almost 26,000 chum salmon into Big Kamishak River fell just above the upper end of the system's SEG range (Table 6; Appendix A25), while around 12,000 chum were estimated as escapement into Little Kamishak River, falling within the system's established SEG range. Harvest from the Douglas River Subdistrict for the season totaled only about 2,800 chum salmon (Table 6).

Following the same pattern as has been the case during recent years, central and northern Kamishak Bay chum runs were once again relatively strong this season. At Bruin Bay River, chum salmon began to show in fresh water in late June, continually building into mid-July. The peak individual aerial survey of Bruin Bay River actually occurred on August 4, when almost 19,000 chum salmon were documented. In spite of the minimal seine effort directed specifically at this stock, the resulting harvest still totaled about 7,000 chum (Table 6), while the final estimate of escapement into Bruin Bay River was just over 21,000 chum salmon (Appendix A25).

Because the run timing for the more northerly chum systems is later than that in southern and central Kamishak areas, aerial evaluation of northern Kamishak systems typically begins in late July, and this season good numbers of fish were already in fresh water of Cottonwood Creek and Iniskin River at that time. By August 4, escapement at Cottonwood Creek totaled nearly 9,000 chum, while that of Ursus Cove systems was building more modestly. Nonetheless, all indicators pointed to strong runs given the date. Steady seine fishing effort began to target these returns, primarily that of Cottonwood Creek, near the mid/end of July, and through August 9 a cumulative total of over 20,000 chums had been reported from that system's subdistrict alone. Although not as impressive as catches in 2005, the steady harvests and good escapement estimates were clear indications that new fish were constantly moving into the district.

Due to escapements that met or exceeded SEGs, the regulatory markers protecting streams at Ursus Cove Lagoon, at the head end of Ursus Cove Subdistrict, were repealed beginning August 15 in order to allow maximum opportunity for seiners to target the chum returns at that location. At Cottonwood Creek, escapement was reasonable but was likely being slowed by the consistent commercial effort targeting this return, while escapement at Iniskin River was progressing only modestly despite the lack of effort. Given the already strong catches within the Cottonwood/Iliamna Subdistrict, and the moderate escapement rate at Iniskin River, the staff elected to leave the markers in effect at both those locations.

Despite continuous fishing time and absence of markers protecting Ursus Cove stream mouths, nearly all of the late season seine effort in northern Kamishak Bay was once again directed at the Cottonwood Creek chum salmon return, and for good reason. Final harvest for the Kamishak

Bay District for the season totaled nearly 84,000 chum salmon for the season (Table 6; Appendix A21), nearly 85% of which came from the Cottonwood/Iliamna Subdistrict. This figure was the third highest for the Kamishak Bay District since 1988. Interestingly, the six largest annual catch totals in this district since 1988 have all occurred during the past 6 consecutive years. Escapements at all Kamishak chum systems met or exceeded the respective SEGs (Appendix A25). The sixth successive season of strong district-wide returns was a continuing sign that the trend of weak chum salmon runs experienced in the 1990's has passed, and future returns will hopefully remain at these stronger levels.

Other Species

Chinook salmon harvests in the Kamishak Bay District historically have been insignificant (Appendix A12). On the other hand, coho harvests within the district have at times been substantial, providing fishermen with some lucrative late season catches. Coho assessment in LCI is very limited, but early signs from other areas within LCI suggested that returns were average to slightly above average. No effort was directed specifically at Kamishak Bay coho salmon in 2005, resulting in a district-wide harvest of less than 100 fish (Appendix A17), reverting back to an 8-year trend of negligible coho salmon catches in this district that was broken by a single upturn during the 2004 season.

Outer District

Sockeye Salmon

Outer District sockeye salmon harvests have traditionally focused on natural runs to the Delight and Desire Lakes systems in East Nuka Bay Subdistrict. A lake stocking project in the Port Dick area during the late 1980's provided additional fish for harvest in the early 1990's, but stocking was discontinued after 1989 and a small harvest in 1993 was the last documented catch. Preseason projections, based solely on the long-term average catch, forecasted a harvest of up to 22,000 sockeye for the entire Outer District this year. The actual harvest totaled only a single fish (Table 3), the lowest harvest on record in the district and not surprising since no directed openings occurred in 2005.

Aerial surveys to assess the Delight and Desire Lake systems in East Nuka Bay began on June 17, with reasonably good numbers of fish (1,100) documented at Desire Lake and much smaller numbers of fish (140) observed at Delight Lake. The figure for Desire Lake was considered earlier than normal, potentially the sign of a strong return. The next aerial survey 3 days later showed that escapement had increased significantly at Delight Lake, with over 1,000 fish estimated in fresh water, while escapement appeared to be lagging at Desire Lake, with no increase noted over the previous survey. By early July, aerial observations at both systems indicated that harvestable surpluses were unlikely this season, thus no openings were announced as assessment continued through the month and into early August. Additionally, an ADF&G operated counting weir at the outlet of Delight Lake became operational on July 3.

Low water levels, and subsequent cessation of upstream salmon migration, are typical conditions observed at Delight Lake following extended periods of warm weather and limited precipitation during the summer. Though the condition traditionally arises in mid-July, this season was instead marked by an earlier appearance of low water levels, beginning in late June. By the end of the first week of July, the chronic low-water problem had reached the "critically" low stage, i.e. making fish passage questionable if not impossible.

No fish passage had been documented at the weir through July 12, when the weir crew finally reported local rain showers and rising water levels in the creek. The next day, sockeye began actively ascending the creek and moving into the lake. Sporadic but periodic rainfall during the remainder of July insured that fish passage would not be a problem again, with the weir recording a cumulative total of 13,800 sockeye escaping into the lake prior to removal of the counting structure on July 28. When combined with aerial estimates of fish escapement prior to installation and after removal of the weir, the final estimate of escapement at Delight Lake totaled 15,200 sockeye salmon (Appendix A23), slightly exceeding the upper end of the established SEG range.

At Desire Lake, sockeye escapement estimates remained low throughout the summer, with a peak aerial estimate of only 4,800 fish in fresh water made on July 14. This figure was ultimately used as the final index of escapement estimate (Table 3; Appendix A23), falling well short of the established SEGs of 8,800 to 15,200 sockeye established for this system. Sockeye salmon escapement at Desire Lake in 2005 was the lowest since 2000.

A third system of lakes known as Delusion (or Ecstasy or Delectable) Lakes in East Nuka Subdistrict has been monitored over the last 15 years to document the sockeye salmon return there. Located near the head of the East Arm of Nuka Bay, the two-lake system is relatively new, formed during the late 1970's and early 1980's by a receding glacier. A review of charts and maps drawn prior to the mid-1980's substantiated this fact as no lakes are indicated at the site of the present bodies of water. Prior to the 1980's, no salmon were known to utilize the system, but in approximately 1989, during a routine aerial survey, adult sockeye salmon were documented in the system by the staff for the first time. Each year since then, aerial surveys have revealed sockeye salmon as well as pink salmon in the system. The peak 2005 aerial count of 1,100 sockeye was recorded during an aerial survey on July 14. Little is known of the origins of this return, although the predominant hypothesis suggests that sockeye probably strayed from nearby Desire and/or Delight Lake to colonize this new lake system. ADF&G personnel conducted sampling of sockeye salmon in this system during 1992, 1993, and 1994, with help from University of Alaska students on site. Otoliths and length measurements indicated primarily large 3-ocean fish (6 years old). Additional tissue samples were taken from post-spawning individuals in 1993 and 1994 for inclusion into the genetic baseline data set and future genetic stock identification analysis.

Pink Salmon

Excellent escapements during the 2003 parent year fostered an optimistic pink salmon harvest forecast of over 900,000 fish for the Outer District in 2005, more than five times the recent 10-year average. The bulk of the harvestable surpluses were expected at Port Dick, with lesser amounts forecasted at Rocky Bay, Windy Bay, and Nuka Island. The actual harvest of 110,000 pink salmon (Table 5; Appendix A18) fell far short of the forecast as well as the recent 10 and 20 year averages, influenced more by market conditions and tender availability than by fishing opportunity or available surpluses.

For the third consecutive year, the staff announced prior to the season that certain waters in Port Dick Subdistrict would open on a set calendar date, as opposed to a management strategy predicated upon real-time aerial assessment of pink salmon returns and escapements in the Outer District. Based on the optimistic forecast, as well as low levels of anticipated effort, waters of the South, Outer, and Taylor Bay Sections of Port Dick Subdistrict were opened to seining 5 days

per week beginning July 18. This set opening date was intended to encourage effort early in the returns, normally dominated by males, and to promote product quality. The North Section of Port Dick Subdistrict was kept closed to fishing to protect the chum salmon return to Island Creek, which has historically displayed a later run timing than the chum return to Port Dick (head end) Creek, until the return could be adequately assessed.

Aerial surveys in Port Dick began during the week prior to the opening, and the numbers of pink salmon observed during the first two surveys suggested that the preseason forecast was potentially accurate. The few seiners that ventured to the area for the opening found spotty catches despite the relatively good numbers of fish protected by regulatory markers at the head end of Port Dick. Aerial surveys at the end of the first week of fishing indicated that the pink return was continuing to build, and because the number of fish protected by regulatory markers at the head end of Port Dick exceeded the SEG, fishing time was liberalized to 7 days per week beginning July 22. Regulatory markers were kept in place for this opening since fresh water escapement had not yet achieved the low end of the SEG.

Despite the reasonable returns and liberal fishing time, harvests in Port Dick remained modest as fishermen encountered difficulty securing tender service to these remote waters. Effort was short-lived, with the final delivery for the season coming on July 24 after a cumulative harvest of 81,000 pink salmon (Table 5; Appendix A19). The final escapement estimate of 122,000 pinks for Port Dick (head end) Creek was over double the upper end of the SEG range of 19,000–58,000 fish established for this system (Table 5; Appendix A24). The pink salmon return to Island Creek never displayed sufficient strength to warrant an opening in nearby waters, therefore the entire return entered fresh water to spawn. The final estimate of escapement at Island Creek totaled slightly over 26,000 pinks, falling near the upper end of the SEG range of 7,200–28,300. Interestingly, the seven highest pink salmon escapement totals on record for Island Creek have all occurred after 1995.

Other pink salmon systems throughout the Outer District generally mimicked a pattern similar to that exhibited by systems in Port Dick during 2005, i.e. reasonably good returns that offered harvest opportunities but were weaker than forecasted. Waters of Windy Bay and Rocky Bay Subdistricts were opened to commercial seining simultaneously with Port Dick on an identical schedule of 5 days per week beginning July 18. Additionally, fishing time in both Subdistricts was extended to 7 days per week beginning July 22, just as in Port Dick, to allow maximum opportunity to harvest the pink salmon returns. However, effort in both subdistricts was light, and resulting harvests totaled about 24,000 pinks in Windy Bay and 5,200 pinks in Rocky Bay (Table 5; Appendix A19). At Windy Left Creek, final escapement was estimated at 72,000 pinks, while the figure for Windy Right was 22,000, both of which exceeded the SEGs for the respective systems (Table 5; Appendix A24). The final escapement at nearby Rocky River totaled almost 199,000 pink salmon, nearly four times the upper end of the SEG range for that system (Table 5; Appendix A24).

Aerial surveys documented weak pink salmon returns to Nuka Island throughout the season, thus no openings occurred, and the final escapement was estimated at just over 11,000 pinks, within the established SEG of 2,700 to 14,000 (Table 5; Appendix A24). Elsewhere in the Outer District, early aerial observations at Port Chatham suggested that an opening directed at pink salmon was possible, and later surveys confirmed this scenario. As a result, waters of Port Chatham Subdistrict were opened to seining 7 days per week beginning July 30, but no effort or harvest resulted. Postseason analysis of ground survey data indicated an estimated cumulative

escapement of over 44,000 pinks into Port Chatham systems (Table 5; Appendix A24), over twice the upper end of the SEG range. Desire Lake Creek, with an SEG range of 2,000 to 20,000 pink salmon, experienced a relatively strong pink return, with an escapement estimated at around 46,000 fish (Table 5; Appendix A24), but no opening was allowed in area waters for fear of harvesting sockeye bound for Desire Lake, where the return was exceptionally weak and escapement failed to reach the SEG.

Chum Salmon

Because chum salmon numbers had experienced dramatic declines in the Outer District since the peak harvest years of the late 1970's and early 1980's, large returns were once again not expected in 2005. The chum returns to systems in the Outer District this season were quite variable compared to recent years. However, in a continuing effort to reverse the trend of weak returns and allow stocks maximum protection, no specific commercial openings targeting chum salmon occurred in the Outer District this season. Nonetheless, the final harvest of 12,500 chum salmon (Table 6; Appendix A21), all taken incidentally during directed pink salmon fisheries in the district, was the second highest since 1991.

The lack of any directed fishing effort likely contributed to escapements slightly exceeding the goals at three of the four monitored chum salmon systems in the Outer District. Port Dick (head end) Creek experienced an escapement slightly greater than the upper end of its SEG, with approximately 4,800 chums, while Rocky River escapement amounted to 6,100 chum salmon, the second highest total over the past two decades (Appendix A25). Chum escapement at Island Creek fell above the upper end of the SEG range of 6,400 to 15,600 fish, with a final total of 20,700 fish. At Koyuktolik (Dogfish) Bay systems, with a combined SEG range of 3,300–9,200 chum salmon, the inexplicably weak escapement was estimated at just 2,700 fish (Table 6; Appendix A25), the smallest figure for this system since 1992.

Eastern District

Sockeye Salmon

The Eastern District showed potential for harvestable surpluses of sockeye salmon in Aialik and Resurrection Bay Subdistricts during 2005, with a district-wide preseason projection totaling over 80,000 fish. Actual harvest totaled 57,000 sockeye (Table 3; Appendices A13 and A14), shy of the forecast but still greater than the recent 10-year average by some 33%. The seine fleet harvested about one-third of the Eastern District sockeye salmon total, almost exclusively from the Resurrection Bay Subdistrict (Tables 1 and 3), while the remaining two-thirds were taken as hatchery cost recovery for the Bear Lake sockeye enhancement project near Seward.

Sockeye enhancement activities by CIAA at Bear Lake resulted in a projected run ranging up to 86,000 fish assuming optimum survival of various smolt and fry releases. If the forecast proved true, the expected harvestable surplus was about 73,000 fish after accounting for the desired inriver escapement requirements for Bear Lake, established at 5,600 to 13,200 sockeye in the 2005 Trail Lakes Hatchery Annual Management Plan (AMP).

In the fall of 2004, the Alaska Board of Fisheries (BOF) passed a proposal that amended the Bear Lake Management Plan. The new section of the plan, implemented for the first time in the 2005 fishery, stipulated that equal shares of the harvestable surplus of sockeye salmon destined for Bear Lake be allocated to the common property seine fleet and to CIAA for hatchery cost recovery. Although new management strategies would likely be required to satisfy this

regulation, several measures from previous years' experience were carried over in the fishery. The seine fleet was to begin fishing on the Bear Lake sockeye run at a relatively early date (mid/late May) in Resurrection Bay in order to promote product quality. In addition, fishing would be allowed 5 days per week (Monday through Friday), which would theoretically allow sufficient opportunity to harvest sockeye without jeopardizing the desired inriver escapement goal for Bear Lake. Closed waters markers were once again posted at the mouth of the Resurrection River to better define the river's mouth and the fishing boundaries, which had been problematic prior to 1996. Finally, an area of closed waters along the west side of Resurrection Bay between Caines Head and the city of Seward was once again utilized in order to protect returning Chinook salmon, which are allocated entirely to the sport fleet and are illegal to retain in the commercial fishery. After a preseason meeting between ADF&G, seiners, and CIAA, plans called for common property seining in marine waters to continue until the end of May, followed by an evaluation of catches up to that point, and finally a determination of subsequent hatchery fishing time. Alternating openings for the two groups would ensue in order to achieve regulatory objectives. CIAA was additionally prepared to harvest fish in the fresh water Special Harvest Area (SHA) at the Bear Creek weir for cost recovery purposes once achievement of the escapement goal was met or could be projected.

Waters of Resurrection Bay Subdistrict north of the latitude of Caines Head were opened to seining by emergency order beginning on Monday, May 16, in keeping with the traditional recent year opening time of mid-May (Table 8). Prior to 1998, these waters were opened on the second Monday in May, but experience had demonstrated that sockeye did not begin arriving in Resurrection Bay in appreciable numbers until the end of the month. Despite presumption of an early run timing for this enhanced run (since broodstock utilized for the project had a documented run timing peaking in early June), the first 3 years of adult runs from 1992 through 1994 actually trickled in over the course of 2 months. Between 1995 and 2004, with larger numbers of fish returning, the majority of the run appeared in waters at the head of Resurrection Bay during the first 2 weeks of June.

When the area first opened in 2005, fishermen were understandably cautious because recent years' runs had not met preseason expectations. As usual, all effort was concentrated at the head end of Resurrection Bay, with the first appreciable landings occurring on May 23, 1 week after the original opening date. Fish concentrations were meager at the time, and relatively poor catches later that same week suggested that the return could be weak or was simply late. By the end of that second week, the cumulative reported harvest totaled around 2,600 sockeye, lending credence to the hypothesis of a weak return. Despite the slow catch rates in marine waters, sockeye salmon first appeared at the Bear Creek weir on May 21, considered quite early even though numbers were small, thus generating some level of optimism.

Both seine effort and harvest increased as expected at the beginning of the third week, the last 2 days of May, bringing the cumulative catch to approximately 6,500 sockeye. The management strategy then called for a closure of the common property fishery, for an undetermined time, so that hatchery fishing could be allowed without competition in an effort to attain a catch total similar to that of the common property fleet. Because CIAA had apparently not finalized a contract for potential hatchery seiners, no fishing occurred on the first day of the hatchery opening as negotiations between the two groups took place. An agreement was reached later that day, and hatchery cost recovery harvest began on June 2. Participants reported reasonable numbers of fish on the grounds, but catches failed to reflect this observation, with a cumulative

catch of only around 1,600 sockeye reported. An additional 4,400 sockeye salmon were reported over the next 2 days, bringing the cumulative hatchery total to around 6,000 sockeye and nearly equaling the common property catch to date. Recognizing that some amount of hatchery harvest of fish escaping the marine fisheries would likely take place at the Bear Creek weir, hatchery fishing in marine waters of Resurrection Bay was closed at the end of the day on June 4 and reopened to seining on the morning of June 6.

The announced common property opening was scheduled to last for 3 consecutive days, with a closure occurring on the evening of June 8. Hatchery fishing would then resume on June 9 and would proceed until the hatchery and common property harvests were approximately equal. Unfortunately, early catches during the common property opening were far below expectations, bringing the cumulative season total harvest to an estimated 8,200 sockeye through June 7. Meanwhile, CIAA had begun selectively harvesting sockeye at the Bear Creek weir for cost recovery while simultaneously allowing fish to pass into Bear Lake as escapement. Through June 7, escapement into Bear Lake stood at 6,000 sockeye, while the cumulative hatchery harvest (combined seine and weir) totaled 8,400 fish. Since the hatchery harvest total slightly exceeded the commercial seine harvest, and since CIAA intended to continue harvesting fish at the Bear Creek weir as long as escapement remained strong, the hatchery seine opening scheduled for marine waters beginning June 9 was no longer justified in an attempt to equalize the harvests and was therefore canceled. Conversely, extending the commercial seine period already underway was warranted to allow commercial seiners the opportunity to maintain a cumulative harvest that was similar to that of the hatchery. As a result, the commercial seine period scheduled to end at 10:00 p.m. June 8 was instead extended until further notice. The duration of the commercial fishing period was to be determined by reported catch (both common property and hatchery), effort, and escapement.

Despite their best efforts, and coupled with continuous fishing time, seiners still expressed frustration at their inability to zero in on large concentrations of sockeye salmon in Resurrection Bay. Peak daily catches for the season occurred on June 9 and 10, averaging only about 2,700 fish for each of those days. Effort continued for several days, with a few fishermen believing the return was simply late, but reality soon overrode any hopes that catches would improve. Effort dropped significantly after June 12, and the last delivery was reported on June 27. Though no effort occurred after this date, waters of Resurrection Bay were closed to seining by emergency order on July 8 to prevent harvest of local chum or pink salmon in area waters (Table 8). Cumulative seine harvest in Resurrection Bay for the season was 19,000 sockeye salmon (Table 3) taken by 15 seiners.

At the Bear Lake weir, the situation was considerably different as numbers of sockeye salmon picked up dramatically in early June then remained fairly steady until late in the month, with an average passage of nearly 450 sockeye per day and an average harvest of over 1,000 fish per day during that time frame. By the first of July, an escapement near the upper end of the SEG had been achieved, thus numbers of fish allowed into the lake began to drop, yet harvests at the weir remained relatively high. Fish passage continued until the weir was shut down on August 2 after a cumulative escapement of 13,400 sockeye (Table 3; Appendix A23) and a cumulative harvest of almost 32,000 sockeye salmon (Table 3). When these numbers were combined with the common property and hatchery seine catches, the total sockeye salmon return to Bear Lake was estimated at just over 70,000 fish (Table 3). Although short of the preseason forecast, the 2005

sockeye return was nonetheless the largest since inception of the enhancement program at Bear Lake.

At Aialik Lake in Aialik Subdistrict, aerial surveys were initiated on June 17, and a surprising count of over 1,100 sockeye salmon was noted in fresh water at this relatively early date. Unfortunately, escapement rose rather slowly over the next 3 weeks, with an aerial estimate totaling 4,600 sockeye in fresh water made on July 8. Since this figure fell within the SEG (3,700–8,000), the waters of Aialik Subdistrict, including Aialik Lagoon, were opened to seining 5 days per week beginning July 11. However, the relative lateness of the opening, coupled with what could only be termed a modest return at best, resulted in minimal effort and a harvest of less than 300 sockeye (Table 3). One more aerial survey of the system was flown in mid-July, ultimately proving to produce the peak daily estimate of the season, resulting in a final escapement index of just under 5,300 sockeye for Aialik Lake (Table 3; Appendix A23).

Pink Salmon

A harvestable surplus of only 15,000 pink salmon was forecasted in Eastern District waters for 2005, on par with the primarily weak returns in most recent years. Because of the expensive nature to adequately assess the small streams there, and also because no directed openings were expected, surveys of Resurrection Bay systems were limited to on-grounds estimates in mid/late August. Results and final estimates suggested that returns were considerably better than expected. At Bear and Salmon Creeks, where the combined pink SEG is 4,900 to 21,700 fish, a total of 34,500 pinks were estimated (Table 5; Appendix A24), the fourth highest on record. The figure for Thumb Cove, with an SEG of 2,400 to 8,900, was estimated at 8,700 pinks, while at Humpy Cove (900 to 3,200 SEG) about 14,600 fish were estimated. Surveys of Tonsina Creek produced an estimate of 9,900 pinks, exceeding the SEG range of 500 to 5,900 pinks. Due to the trend of primarily weak but highly variable returns during recent years, no openings for pink salmon were allowed in Resurrection Bay this season and therefore no harvest occurred. In Aialik Bay, although no directed pink salmon openings were allowed this season, a minor harvest of 13,000 pinks (Table 5) came as incidental catch during directed efforts at sockeye salmon in the district.

Other Species

Chum salmon have occasionally been an important component of commercial catches in the Eastern District, but catches during the past 10 years have averaged only about 350 fish annually. This season's chum harvest slightly exceeded that figure, amounting to 385 fish (Table 6; Appendix A21), taken incidentally during the Resurrection Bay directed sockeye fishery in June and in the directed sockeye salmon fishery in Aialik Bay in July. Due to a pattern of weak Eastern District runs over the past 10–15 years, no directed openings for chum salmon were allowed in the Eastern District this season. Approximately 1,500 chum salmon were estimated as escapement into Tonsina Creek in Resurrection Bay (Table 6), continuing the trend of weak returns to this system.

Coho salmon are not normally a commercially important species in the Eastern District but are an integral component of an enhancement project, originating from Bear Lake, which benefits sport fishermen in area waters. Because the Resurrection Bay Salmon Management Plan specifically directs ADF&G to manage coho stocks for recreational use only, coho salmon may not be retained in the commercial fishery. However, all sport caught coho salmon entered into the Seward Silver Salmon Derby are subsequently sold by the city of Seward, organizer of this

sport fishing derby, to a commercial processor. Therefore, these catches are considered "commercial harvests" and are listed in the commercial catch tables to document this fact. In 2005, a total of 4,800 coho salmon were entered into the Seward Silver Salmon Derby (Tables 1 and 4). In addition, a portion of the returning adults from the enhancement project are traditionally harvested at the Bear Creek weir by CIAA as cost recovery for expenses incurred. During years when the salmon market was strong, CIAA customarily sold most cost recovery caught coho to a commercial processor(s). Because market forces now make product quality a central issue, many coho taken at the weir are unmarketable due to excessive fresh water marking. As has become common place in recent seasons, all coho caught at the Bear Creek weir this year were donated to various individuals, many of whom were dog mushers. Total hatchery harvest from the Bear Creek weir was approximately 1,500 coho salmon (Tables 1 and 4), comprising about 17% of the entire LCI coho catch this season. Just under 700 coho were collected for hatchery broodstock, while an additional 3,300 fish were allowed into Bear Lake as escapement (Table 4). Total commercial catch in the entire Eastern District amounted to about 6,300 coho (Table 4; Appendix A17), marginally exceeding the recent 10-year average of 6,000.

2005 SALMON ENHANCEMENT AND REHABILITATION

INTRODUCTION

Fisheries enhancement has played a major role in LCI salmon production for nearly three decades. Natural adult salmon returns to the LCI area continue to demonstrate wide fluctuations, often the result of environmental impacts such as streambed scour, de-watering, or redd freeze-out on spawning grounds, all of which potentially lower overall survival rates. Since their inception in the mid 1970's, enhancement and rehabilitation projects have made significant contributions to both commercial and sport fishing harvests. These contributions have historically ranged from 24% to 90% of the entire LCI commercial salmon harvest and are expected to remain high in future years.

Projects initiated by the ADF&G and presently being undertaken by CIAA provided an estimated 68% (1.81 million salmon) of the total 2005 LCI commercial harvest of 2.65 million fish. PGHC produced fish contributed an additional 19%, or 0.5 million fish, to LCI salmon harvests in 2005. The Leisure/Hazel, Kirschner and Bear Lakes sockeye salmon enhancement projects produced just over 40% (95,000 fish) of the total LCI sockeye harvest of 232,700 fish in 2005, down from the 52% contribution last year and far from the record high of 84% contributions in both 1995 and 1999. Tutka Lagoon Hatchery production accounted for over 70% (1.64 million fish) of the 2005 LCI commercial pink salmon harvest of 2.31 million fish, while Port Graham Hatchery accounted for about 22% (0.5 million fish).

Using average weights per fish and average prices per pound in LCI, the estimated contribution of CIAA and PGHC produced salmon was 66% ($1.07 million) of the $1.63 million total value of the 2005 LCI commercial salmon harvest. About 45% ($0.73 million) of the total exvessel value of the fishery was utilized for hatchery cost recovery purposes (Table 7). A brief description of the current enhancement projects in LCI follows.

TUTKA LAGOON HATCHERY

The Tutka Lagoon Salmon Hatchery/Rearing Facility was constructed in 1976 with an initial production capacity of 10 million salmon eggs, but expansion over time, including major

renovation work during the winter of 1993–1994, increased its capacity to the present level of approximately 150 million eggs. Pink salmon have been the primary species produced at the hatchery, while secondary chum enhancement was discontinued in favor of efforts directed toward sockeye salmon. Although the hatchery has a sockeye egg capacity of 1.8 million eggs, and raceways to accommodate the resulting fry, efforts to incubate and rear sockeye to the smolt stage have been plagued by the IHN virus, resulting in an indefinite termination of the sockeye program. In 2004, CIAA announced suspension of Tutka Hatchery operations, essentially ending the annual full-scale pink salmon incubation and release program. The last adult pink salmon return to the facility occurred in 2005, the result of brood collection in 2003 and subsequent fry release in 2004.

In 2005, the overall return of adult pink salmon produced by Tutka Lagoon Hatchery totaled approximately 1.77 million fish (Table 9). No attempt was made to identify the contribution resulting from natural spawning in Tutka Creek. The estimated 3.7% overall survival rate this season was easily the highest since 1995 and also higher than the long-term estimated average survival of around 2.1%. The commercial harvest, including cost recovery, of 1.637 million pink salmon from Tutka Bay and Lagoon (Table 9) accounted for three-fourths of the pink salmon landed in the Southern District and 71% of the entire LCI commercial pink salmon harvest. Pinks taken for hatchery cost recovery purposes from the Tutka Bay Subdistrict totaled 1.632 million fish, worth approximately $341,000, less than half of the $888,000 sales revenue goal for 2005. Because operations were suspended at the hatchery at the conclusion of the 2004 season, no pink salmon fry were released from Tutka Hatchery in 2005 (Appendix A34) and no adult broodstock collected.

In a matter related to the LCI sockeye salmon lake stocking program, CIAA intends to utilize Tutka Lagoon as a remote release site for sockeye salmon in an effort to develop a return to that site. Such a program became necessary when the original sockeye salmon brood source for the LCI lake stocking program, Tustamena Lake in Upper Cook Inlet, became unavailable due to a federal court ruling. In an effort to overcome this obstacle and continue the LCI sockeye program, CIAA applied for and successfully received a permit to collect and incubate eggs from Hidden Lake sockeye salmon, in the Kenai River drainage of Upper Cook Inlet, for use in this project. Plans call for an egg collection from that location for approximately 5 years, incubation of the eggs and rearing of fry at Trail Lakes Hatchery in Moose Pass, and release of smolt at Tutka Lagoon. Ultimately CIAA expects to utilize sockeye adults returning to Tutka Lagoon as the source of eggs to supply the LCI lake stocking program that includes Leisure, Hazel, and Kirschner Lakes. In the initial release for this program, CIAA released an estimated 96,000 sockeye salmon smolts from Tutka Lagoon in 2005 (Appendix A34).

LEISURE AND HAZEL LAKES SOCKEYE SALMON STOCKING

Leisure (China Poot) Lake, located on the south side of Kachemak Bay across from the Homer Spit, historically was a system barren of sockeye salmon. A study initiated in 1976 involved the evaluation of stocking of hatchery-produced sockeye salmon fry to determine optimum stocking levels prior to and after lake enrichment through fertilization. Because a barrier falls below the lake prevents upstream migration and precludes any adult spawning, it is desirable to harvest all returning adult fish in the terminal harvest area, China Poot Bay. Beginning in 1988, a similar sockeye stocking program was initiated at Hazel Lake, which empties into Neptune Bay and is located approximately 3 miles south of Leisure Lake. Since the inception of these projects, over 2.76 million adult sockeye were estimated to have returned as a result of these stocking programs

(Appendix A15), making significant contributions to the commercial and recreational sockeye harvests in the Southern District.

Because of the close proximity of the two terminal harvest areas, and the absence of a mark/recovery program, adult returns to Leisure and Hazel Lakes cannot be separately identified through sampling within the commercial catches and are therefore presented as a combined total. The cumulative total sockeye return to Leisure and Hazel Lakes in 2005 was estimated at just under 101,000 fish (Figure 10; Appendix A15), the fourth lowest figure since those two returns have been tallied together beginning in 1991. The cumulative estimated commercial harvest of 95,100 fish comprised approximately 86% of the Southern District sockeye harvest and just over 40% of the total LCI sockeye salmon harvest. The Southern District sockeye harvest of 110,700 fish was the second consecutive below average harvest over the past decade.

Leisure Lake was stocked with 2.25 million sockeye fry in 2005, while Hazel Lake was stocked with 1.56 million fry, both figures increased over the respective previous 10-year average stocking rates for these two systems (Appendix A34).

As previously mentioned, the brood source for the LCI lake stocking programs, from Tustamena Lake, became unavailable to CIAA after 2004. CIAA has initiated a remote sockeye salmon release program from Tutka Lagoon, utilizing sockeye eggs collected from Hidden Lake broodstock in Upper Cook Inlet. Egg collections from this location are expected to occur for approximately 5 years, after which time the adult sockeye returning to the Tutka Lagoon release site will be utilized as the permanent brood source to supply not only the Leisure/Hazel releases but the Kirschner Lake sockeye salmon enhancement project in Kamishak Bay.

ENGLISH BAY SOCKEYE SALMON REHABILITATION

The English Bay Lakes system has the only significant stock of sockeye salmon native to the Southern District of LCI. Unfortunately, English Bay sockeye runs declined to their lowest recorded levels in the last half of the 1980's decade. Sockeye escapement estimates between 1985 and 1993 ranged from 2,500 to 8,900 fish; all but one of these years (1993) was well below the 20-year average of 7,800 fish (Appendix A23). The decline of the English Bay sockeye run resulted in a very restrictive management strategy for this area. The commercial, sport, and subsistence fisheries were closed during the sockeye run for most years mentioned. Efforts to rehabilitate this depressed stock were initiated by ADF&G with an egg take in 1989 and the subsequent release of 350,000 sockeye salmon fry in 1990 (Appendix A34). Chugach Regional Resources Commission (CRRC), in cooperation with the village of Nanwalek (formerly English Bay) and the Bureau of Indian Affairs (BIA), has since taken over this enhancement project, now known as the Nanwalek Salmon Enhancement Project (NSEP). NSEP has continued broodstock and egg collections/incubation, fry rearing, fry stocking, and operation of a smolt/adult enumeration weir.

Whereas the escapement figures for English Bay Lakes prior to 1994 were index estimates based on aerial surveys, escapements beginning with the 1994 season have been monitored with a counting weir, operated by CRRC/NSEP. The cumulative total that first year numbered 13,800 sockeye (Appendix A23), up to that time the highest return since 1982 and the first year since 1984 in which the minimum desired goal of 10,000 fish was achieved. In 1995 and 1996, the weir totals were 22,500 and 12,400, respectively, with the former representing the highest figure over the past 20 years.

In the early 1990s, optimum escapement for this system was estimated to be less than the original maximum goal of 20,000 sockeye (Edmundson et al. 1992). A plan to tightly control spawning escapement into the lake by harvesting those fish surplus to the maximum desired goal of 15,000 was adopted by ADF&G staff, representatives of CRRC/NSEP, and village residents from Nanwalek during meetings held over the winter of 1995–1996. This escapement goal remained in place during the years 1996–2001. After the 2001 season, ADF&G conducted an escapement goal review for all salmon systems in the LCI management area and presented the results to the Alaska Board of Fisheries (BOF) at its Anchorage meeting in November 2001. The BOF approved the new sustainable escapement goals (SEGs) proposed by ADF&G, and the new goals were implemented for the first time in 2002. Based on ADF&G's analysis, the new SEG for English Bay Lakes was expressed as a range of 6,000 to 13,500 sockeye. When the sockeye enhancement project's annual broodstock requirements, which are removed from the escapement into the lakes, were added onto the SEG, the desired inriver escapement goal became a range of 9,400 to 16,900 sockeye (midpoint 13,150) for the 2005 season.

Unfortunately, the preseason forecast for sockeye salmon returning to the English Bay Lakes system was only 4,000 fish in 2005. Since this figure was less than the low end of the SEG, waters of Port Graham Subdistrict, including both Port Graham and English Bay Sections, were not allowed to open to commercial set gillnet fishing in early June this season. In addition, the subsistence fishing season in local waters, which initially opened on April 1, was also closed beginning June 1 since all returning adults would likely be required for biological requirements. The poor adult return forecast this year was due to lower smolt emigration numbers in 2002 (24,500 smolts, down from 175,000 in 2001) and 2003 (45,000 smolts). An egg removal schedule for English Bay Lakes was included in the 2005 Port Graham Hatchery Annual Management Plan (AMP) to allow a limited egg take should the return be stronger than forecast.

The CRRC/NSEP enumeration weir was installed and became operational on May 19, with the first fish passage documented on May 25, but at less than 10 fish numbers were expectedly low. No further fish passage was observed until June 5, at which time daily passage rates began a modest increase that lasted for the next 2 weeks. During this time, the peak single-day count was 426 fish passed on June 12. After June 18, with a cumulative count of around 2,900 sockeye, the passage rate dropped for about 1 week before once again picking up. By June 27, the cumulative escapement reported through the weir totaled approximately 5,000 sockeye, with additional fish located in the intertidal lagoon located just downstream from the weir. Since the return was approaching its halfway point based on historical run timing information, staff felt confident that an escapement within the SEG range would be achieved. As a result, subsistence set gillnet fishing in waters of Port Graham Subdistrict, including both the Port Graham and English Bay Sections, was reopened to fishing on the regularly scheduled weekly fishing periods beginning June 30. Recognizing the greater harvesting potential of the commercial fishery, the staff elected to keep the fishery closed.

Daily escapement counts remained at their highest of the season at the end of June and beginning of July, peaking on July 2 when nearly 800 sockeye were recorded. The final cumulative escapement for the season was estimated at 8,200 sockeye (Table 3; Appendix A23), greater than the low end of the SEG range but failing to achieve the desired inriver goal. Nonetheless, because the sockeye run was stronger than forecast and the escapement fell within the SEG range, the egg removal schedule allowed for a limited broodstock collection of approximately 1,100 sockeye salmon adults from the English Bay Lakes system. For unknown reasons, NSEP

elected not to collect any fish for broodstock in 2005, therefore no egg take occurred. With another poor forecast for the adult sockeye run to English Bay Lakes, it is unclear whether sockeye eggs will be collected in 2006.

The commercial set gillnet fishery in Port Graham Subdistrict remained closed to fishing for the entire season in 2005, thus no harvest resulted. The 2005 subsistence harvest by villagers from Port Graham and Nanwalek, annually compiled by ADF&G's Subsistence Division, was unavailable at the time of publication and therefore no figures are available. Historical subsistence catches in these two villages can be found in Appendices A31 and A32. The cumulative total run of sockeye to English Bay Lakes in 2005, including escapement but excluding subsistence harvest, was estimated at 8,200 fish.

Under contract to CIAA, eggs collected in 2004 by PGHC from English Bay Lakes sockeye salmon broodstock were incubated, and fry subsequently reared, at Trail Lakes Hatchery near Seward. An estimated 203,000 fry were released directly into English Bay "Second" Lake during October this season (Appendix A34).

BEAR LAKE SOCKEYE SALMON ENHANCEMENT

Bear Lake, located at the head of Resurrection Bay in the Eastern District, has been the target of sockeye salmon enhancement efforts for over a decade. Since 1962, this system has also been the centerpiece of a Sport Fish Division coho salmon enhancement program, part of which included limiting the escapement of sockeye salmon into the lake. As a result, only a small remnant run of naturally spawning sockeye salmon remained at Bear Lake. In an effort to produce increasing numbers of adult sockeye without adversely affecting coho salmon production, as mandated by Board of Fisheries policy, CIAA undertook a sockeye stocking program beginning in 1989 with the release of 2.2 million sockeye fingerlings. Since then, additional releases of fry, fingerlings, and accelerated growth ("zero check") smolts have occurred, ranging from 0.2 to 3.4 million juvenile sockeye salmon each year (Appendix A34).

The first year of enhanced adult sockeye runs in 1992 was discouraging, with a total of less than 2,000 fish, but returns increased during each of the following three seasons. The run in 1996 was almost identical to that of 1995, totaling nearly 53,000 sockeye, the highest to date. Since 1996, runs have not met the system's hypothesized potential.

Management objectives in the commercial salmon fishery in Resurrection Bay changed beginning with the 2005 season, after the Alaska Board of Fisheries passed a proposal in the fall of 2004 allocating equal harvest shares of Bear Lake sockeye salmon to CIAA and the commercial seine user group. Initial plans called for an opening for commercial seiners from mid/late May to the end of May, followed by a hatchery opening to allow that group to harvest a like number of fish, and subsequent alternating openings designed to keep the overall harvest similar between the two groups. Additionally, CIAA intended to harvest sockeye salmon that were excess to escapement requirements at the Bear Creek weir.

The harvestable surplus of sockeye salmon bound for Bear Lake was forecasted at 73,000 fish in 2005. The initial commercial seine fishing schedule implemented in waters of Resurrection Bay was similar to some recent seasons at 5 days per week beginning May 16. Commercial harvests as well as escapement trends were monitored closely, with the first seine catches reported on May 22 and the first fish arriving at the weir the day before, both considered early by historical standards although numbers were small. By the end of May, around 6,500 sockeye had been

harvested by commercial seiners, and a subsequent hatchery opening of 3 days netted that group about 6,000 sockeye. Although alternating openings for the two groups were envisioned after this time, a combination of relatively poor commercial catches, strong escapement, and selective hatchery harvest at the weir eliminated the need for further hatchery openings in marine waters. Commercial fishing in Resurrection Bay was expanded to 7 days per week beginning June 6 to allow maximum opportunity for seiners to maintain a harvest of sockeye approximating that of CIAA. Despite their best efforts and reasonably good numbers of fish transiting open waters, the commercial fleet was unable to locate major concentrations of sockeye and slow the run down. Believing that the return was much weaker than forecast, seiners began dropping out of the fishery after June 10, and those that remained continued to experience frustration at their inability to catch fish in quantities suggested by numbers at the weir. The last commercial seine delivery was made on June 27, bringing the cumulative harvest to about 19,000 sockeye (Table 3) taken by 15 seiners. The hatchery catch totaled 6,000 sockeye (seine) and 31,700 (weir), with a final cumulative escapement of 13,400 sockeye (Table 3; Appendix A23). The 2005 Bear Lake total run (escapement, hatchery and commercial catch) equaled just over 70,000 sockeye, below the preseason forecast but still the largest return to Bear Lake since the inception of the enhancement program.

A cumulative total of approximately 3.4 million sockeye fry, pre-smolts, and smolts were released into Bear Lake/Creek during 2005 (Appendix A34), while 4.0 million sockeye eggs were collected for incubation over the 2005–2006 winter at Trail Lakes Hatchery in Moose Pass. Increased stocking levels in Bear Lake over the past four seasons are expected to increase adult returns commensurately in future years.

OTHER SOCKEYE SALMON LAKE STOCKING

Kirschner Lake in the Kamishak Bay District was first stocked with sockeye salmon fry in 1987 (Appendix A34), and 2005 marked the seventeenth year that adult sockeye have returned to this site. This year the entire catch of 15,000 fish (Table 3) was harvested and sold to recoup hatchery operating expenses, and no directed commercial effort was allowed. The 2005 run, estimated at around 16,500 sockeye including unharvested fish, failed to achieve the preseason forecast of 24,000 fish but was similar to the return of 17,000 fish estimated last year. The Kirschner Lake system has remained one of the steadiest producers of LCI stocked lakes since the inception of the program at that site. Approximately 316,000 sockeye salmon fry were stocked into Kirschner Lake in 2005 (Appendix A34).

Few sockeye salmon were expected to return to four other Kamishak Bay lake systems (Bruin, Ursus, Upper Paint, and Lower Paint) in 2005. All of these systems were evaluated through pre-stocking studies conducted between 1986 and 1989 and were regularly stocked with sockeye fry between 1988 and 1996 (Appendix A34). After that time, all stocking at these sites was suspended, with one exception. CIAA was granted a one-time permit to experimentally stock Upper Paint Lake with 536,000 sockeye “pre-smolts” in early October of 2002. An amendment to the 2002 Trails Lake Annual Management Plan allowed the aquaculture association to stock juveniles that were surplus to the 2002 AMP stocking schedule, a result of unexpectedly high survival rates during the incubation phase at Trails Lake Hatchery. This was the first time the Paint River Lakes system has ever been stocked in the fall with fry that were reared to the pre-smolt stage; all previous releases were of traditional spring/early summer fry releases. Permit conditions for this experimental stocking required that CIAA conduct smolt outmigration studies in the spring of 2003, which resulted in a smolt count of only 7,000 fish, suggesting that over-

winter survival was poor. Furthermore, follow-up hydroacoustic surveys in October 2003 revealed that no fingerlings were over-wintering in the lake system, refuting the hypothesis that the stocked juveniles may have held over in the lake for an additional year. The first adult sockeye resulting from the pre-smolt release returned to Paint River in 2005 as age-1.2 fish, and with an estimated total of 2,000 fish, the return was much better than expected. This return would suggest that the assessment work conducted in the spring of 2003 might have missed the majority of the smolt outmigration, which likely occurred after ice-out but prior to installation of the enumeration weir.

HALIBUT COVE LAGOON AND SELDOVIA BAY CHINOOK SALMON ENHANCEMENT

Chinook salmon enhancement projects at Halibut Cove Lagoon and Seldovia Bay involve the remote release of Chinook salmon smolts, with the objective of increasing sport fishing opportunities in Kachemak Bay. The program at Halibut Cove Lagoon is the oldest and one of the most popular sport fishing enhancement projects in LCI, operating continually with an annual release of smolts since 1979. Although adult returns from the two stocking programs are not intended for commercial harvest, there is incidental harvest of these Chinook salmon in the commercial set gillnet and seine fisheries. The long-term estimated incidental harvest of enhanced Chinook salmon by commercial fishermen in Halibut Cove Subdistrict has been approximately 30% of the total annual run, but no such estimates are available for the commercial fishery in Seldovia Bay Subdistrict. Percentage figures for the incidental Chinook harvest during 2005 were not generated but were thought to be below the historical average. The commercial harvest of Chinook salmon in Halibut Cove and Seldovia Bay Subdistricts this season totaled approximately 366 and 66 fish, respectively, while 113 Chinook were caught in Tutka Bay Subdistrict (Table 2). The cumulative Southern District Chinook salmon harvest of 621 during 2005 represents the smallest total since 1980. Historical releases of juvenile Chinook salmon at these two project sites are found in Appendix A34.

PORT GRAHAM HATCHERY

In an effort to supplement natural fish production and provide increased employment opportunities in the native village of Port Graham, the Port Graham Hatchery Corporation (PGHC) applied for and received a permit to operate a private non-profit (PNP) hatchery in 1992. Port Graham is located approximately 21 nautical miles southwest of Homer on the south side of Kachemak Bay (Figure 2). The hatchery had conducted experimental pink salmon egg-takes and fry releases via a scientific/educational permit from 1990 through 1992, while these activities were subsequently permitted in the Port Graham Hatchery Basic and Annual Management Plans (BMP/AMP). Original startup broodstock was collected from a natural run of pink salmon in the Port Graham River, at the head of Port Graham, and the PNP permit for PGHC allows for continued pink salmon broodstock collection from this source. However, the Port Graham River pink run has historically experienced significant natural fluctuations in escapements despite conservative fishing schedules, causing some concern for protection of the natural stocks. Consistent with the priority of managing for natural stocks (**AS 16.05.730**), a broodstock collection schedule based on the sustainable escapement goal for Port Graham River, as well as historical escapement levels, was developed to offer maximum protection to the wild pink salmon stock during years of weak returns.

Harvest of both natural and hatchery stocks could potentially occur in commercial purse seine and set gillnet fisheries, as well as a subsistence set gillnet fishery, in Port Graham since the

returning hatchery fish would undoubtedly intermix with wild stocks bound for the Port Graham River. Management decisions attempt to address the effects of these various fisheries to protect natural stocks until adequate escapement into Port Graham River can be confirmed. A small natural run of chum salmon to Port Graham River also occurs, and since this run has been depressed in recent years, management measures also strive to protect this species as well.

The approved Port Graham Hatchery BMP designated a salt water Special Harvest Area (SHA) to allow for broodstock collection and cost recovery harvest (Figure 6). The SHA was designed to provide a migration corridor on the northeast side of the bay for wild stocks traveling to Port Graham River at the head of the bay, thus affording some limited protection to the natural spawning stocks of pink and chum salmon.

Pink salmon returns to Port Graham Hatchery have historically ranged from zero (1992 and 1993) to 1.36 million (2004), the latter the record for the facility to date. Unfortunately, annual returns have failed to achieve preseason projections during most years since the hatchery initiated operations, and in many years most if not all returning fish have been used solely for broodstock.

The release of 36.3 million pink salmon fry from the Port Graham Hatchery in the spring of 2004 was a considerable decrease from the 57.2 million released the previous year but still the second highest on record (Appendix A34). This release generated an adult return forecast for 2005 of approximately 835,000 fish. The actual total return (hatchery cost recovery and broodstock) totaled 600,000 fish, or about 72% of the preseason forecast and the second highest return to the hatchery facility. The bulk of the return (85%) was utilized to recoup operational expenses, with another 84,000 fish used for broodstock purposes. Hatchery personnel estimated that an additional 5,000 pinks, believed to be of hatchery origin, entered nearby Duncan Slough to spawn. In the Port Graham River approximately 69,000 pink salmon were estimated as escapement, surpassing the upper limit of the established SEG range (Appendix A24) and setting an all-time record for this stream. An estimated 26.6 million pink salmon fry were released from the Port Graham Hatchery in the spring of 2005 (Appendix A34), the second consecutive year of reduced pink salmon releases.

Although all efforts prior to 1993 were directed towards pink salmon, sockeye salmon production has also been underway at the Port Graham Hatchery. During some years since 1993, the facility has incubated sockeye salmon eggs collected from English Bay Lakes broodstock as part of that enhancement project, with the resulting fry destined for eventual release back into the lake system. Prior to 1993, eggs from this collection site were incubated at Big Lake Hatchery near Wasilla. After incubation and hatching at the Port Graham Hatchery, fry were transported back to the English Bay Lakes the following spring for either direct release or long-term rearing in net pens prior to release (for additional information, see the previous "**English Bay Sockeye Salmon Rehabilitation**" section). More recently, PGHC has contracted with CIAA to incubate sockeye salmon eggs and rear sockeye salmon fry originating from English Bay Lakes broodstock at Trail Lakes Hatchery in Moose Pass.

In 2003, a hatchery permit alteration request (PAR) was submitted by the PGHC to allow development of a sockeye salmon return to marine waters near the village of Port Graham. The permit was approved for 2 years, allowing the corporation to collect up to 1.8 million sockeye eggs from English Bay Lakes broodstock for incubation at the Port Graham Hatchery (this figure is in addition to the 1.35 million permitted egg capacity for the separate English Bay Lakes

sockeye project). The original project plans called for rearing the emergent fry in impermeable rearing pens, also known as "vertical raceways", anchored in salt waters of Port Graham Bay near the hatchery facility. During the rearing process, fry are to be fed while gradually being acclimated to salt water. Upon full salt water acclimation, fry will then be transferred into salt water net pens, where rearing will continue until fry reach a size of 12 to 15 grams, at which time they will be released. This year, fry resulting from the 2004 egg take at English Bay "Second" Lake were reared at Trail Lakes Hatchery, with a portion transported back to English Bay Lakes and released in October 2005. Plans call for the remaining 0.5 million sockeye to continue rearing at Trail Lakes Hatchery, after which they will be transported to net pens in Port Graham Bay in spring of 2006 and subsequently released after a period of further rearing and imprinting.

PAINT RIVER FISH PASS

The Paint River system in the Kamishak Bay District contains at least 40 kilometers (25 miles) of potential salmonid spawning and rearing habitat. Currently the Paint River system is barren of salmon because of a waterfall at tide line that was impassable prior to 1993. ADF&G and CIAA initiated feasibility studies for a fishway in 1979. CIAA received State and Federal grant funds to build the fishway, completing construction in the fall of 1991. ADF&G Commissioner Carl Rosier declared the fish pass officially operational in January 1993.

To test the feasibility of developing a sockeye salmon return to the fish pass project site, the Paint River Lakes were first stocked with sockeye fry in 1986 and annually from 1988 through 1996, except in 1994 when no fry were available (Appendix A34). Because adult returns from these plantings proved negligible, CIAA discontinued fry stocking after the 1996 season (except for an experimental release in 2002, see previous heading **"Other Sockeye Salmon Lake Stocking"**). Due to the small numbers of annually returning fish, the Paint River fish pass has never opened to migrating adult salmon and no freshwater escapement has ever occurred.

2006 COMMERCIAL SALMON FISHERY OUTLOOK

SOCKEYE SALMON

Commercial sockeye salmon harvests in LCI during 2006 could approach 331,000 fish, which is marginally greater than the recent 10-year average catch of 324,000. Nearly three-fourths of the total sockeye harvest should be a result of continuing enhancement and lake stocking projects in LCI. Forecasted returns to enhancement sites at Leisure and Hazel Lakes in the Southern District during 2006 are expected to increase over the previous two seasons, with a harvest projection of about 89,000 sockeye anticipated at Leisure Lake/China Poot Bay and an additional 59,000 sockeye expected at Hazel Lake/Neptune Bay.

Kirschner Lake in the Kamishak Bay District is expected to produce over 24,000 adult sockeye in 2006. This projection is based on actual stocking rates combined with average assumed survival rates over the past decade. Stocking in other Kamishak Bay systems, such as Bruin, Ursus, and Paint River Lakes, has now been discontinued, and no runs are expected back to these systems in 2006, although a negligible number could return to Paint River as a result of a one-time experimental release in 2002. Despite the discontinuation of the stocking program at Chenik Lake in the Kamishak Bay District, the sockeye run to that system, and potential harvest opportunities, remain questionable in 2006. It should be noted that the adult sockeye runs to that site over the past three seasons, all entirely the result of natural production, were unexpectedly

the strongest since 1993, leaving open the possibility that another strong return could produce a harvestable surplus in 2006.

The 2006 enhanced sockeye run to Bear Lake (fifteenth year of enhanced returns) is expected to produce a harvest of about 74,000 fish after accounting for broodstock and escapement requirements. The management plan now in place, adopted by the Alaska Board of Fisheries at their November 2004 meeting in Anchorage and implemented for the first time in 2005, specifies that the harvestable surplus is to be split equally between CIAA for hatchery cost recovery and the common property seine fleet.

The preseason forecast for English Bay Lakes in the Southern District calls for no harvestable surplus in 2006, resulting from low stocking levels and low smolt outmigration counts during previous years. The prediction for a weak return will likely dictate very restrictive management measures, including the potential for total closures, in both the commercial and subsistence set gillnet fisheries of Port Graham Subdistrict.

Based solely on average historical harvests, natural sockeye run projections for LCI could be expected to contribute up to 85,000 fish to commercial catches in 2006. Despite not reaching the preseason prediction during recent years, natural sockeye runs have nevertheless been generally positive, with a concurrent improvement in both spawning escapements to and harvestable surpluses at most systems. The Southern District is expected to contribute the most to the harvest of non-enhanced stocks, while additional catches could come from the East Nuka Bay systems of Delight and Desire Lakes in the Outer District, Aialik Lake in the Eastern District, and Mikfik and/or Chenik Lakes in the Kamishak Bay District.

PINK SALMON

Harvest of pink salmon in LCI during 2006 could approach 800,000 fish, with enhanced production expected to provide just over 60% of the total. The pink return to Port Graham Hatchery is projected to produce a harvest approaching 491,000 fish based on a release of just under 27.0 million fry 2005. However, broodstock and cost recovery requirements are expected to account for all pinks returning to the Port Graham Hatchery. Tutka Hatchery in the Southern District has suspended all activities, therefore no pink salmon are expected back to that site as a result of hatchery releases.

Natural pink salmon spawning escapement levels into most major LCI systems were considered reasonably good in 2004, contributing to a modest harvest projection of 309,000 naturally produced pink salmon throughout the entire LCI management area (Otis *In prep* b). The bulk of the 2006 predicted surplus is expected to occur at Port Dick in the Outer District, with a number of other potential but smaller surpluses occurring in that district. Only minor surpluses are predicted in Kamishak Bay and Southern District systems in 2006. The forecast, however, must be viewed with caution based on the recent history of erratic tender service, weak markets, and a lack of active buyers, and it therefore remains questionable whether the harvest forecast of naturally produced pinks will be realized in 2006.

CHUM SALMON

Based solely on recent years' average harvests (after 1988), the total LCI commercial chum salmon catch is projected to reach 39,000 fish during 2006. Chum runs have rebounded in recent years, however, resulting in commercial catches that exceeded the 2006 forecast figure during all but one of the past five seasons. This suggests that actual harvests during 2006 could be greater than the

projection, and based on the recent years' pattern, the greatest potential for harvest opportunities will likely occur in the Kamishak Bay District. The LCI chum harvest will consist exclusively of natural production since chum salmon enhancement is no longer conducted in LCI.

CHINOOK AND COHO SALMON

No formal harvest forecast is prepared for Chinook or coho salmon in LCI. However, average annual harvests since 1980 indicate that about 1,300 Chinook and 13,000 coho salmon can be expected to contribute to LCI commercial harvests in 2006.

Following are the projected harvest figures by species in the Lower Cook Inlet management area during 2006:

Species	Harvests of Enhanced Returns	Harvests of Natural Returns	Total Harvest
Chinook	[a]	[a]	1,300[a]
Sockeye	246,200[b]	84,700[c]	330,900
Coho	[a]	[a]	13,400[a]
Pink	490,800[b]	309,000	799,800
Chum	0	38,800[c]	38,800
Total	737,000	432,500	1,184,200

[a] Commercial harvest forecasts of Chinook and coho salmon represent average harvests since 1980 and are comprised of a combination of naturally-produced fish as well as fish produced from enhancement programs in LCI; no attempt is made to separate the two components.

[b] Includes common property plus cost recovery harvests.

[c] Harvest forecasts for naturally-produced sockeye and chum salmon are simply average commercial harvests since 1980 and 1989, respectively.

2005 SUBSISTENCE AND PERSONAL USE SALMON NET FISHERIES

KACHEMAK BAY PERSONAL USE SET GILLNET FISHERY

The Southern District (Kachemak Bay) fall coho salmon gillnet fishery dates back prior to statehood under varying names, being known as a "personal use" fishery during the years 1986-1990, 1993, and 1995–present, and as a "subsistence" fishery in 1991, 1992, and 1994. Numerous court rulings affected the status of this fishery during the 1980's and 1990's, causing it to change in status between the two categories. The most recent court action, after the 1994 fishery, reestablished the "subsistence" and "non-subsistence" areas originally created by the Alaska Board of Fisheries (BOF) in 1992, and because most of Kachemak Bay was included in a "non-subsistence" classification, the subsistence fishery and the regulations governing it were no longer valid. The BOF re-adopted personal use regulations governing this fishery into permanent regulation for the 1995 season and rescinded the subsistence regulations formerly governing the fishery. Those personal use regulations have remained in effect since that time.

The target species in the Kachemak Bay gillnet fishery is coho salmon, with returning fish a mixture of natural stocks primarily bound for the Fox River drainage at the head of Kachemak

Bay and enhanced runs bound for the Nick Dudiak Fishing Lagoon, located on the Homer Spit. A former coho enhancement project at Fox Creek/Caribou Lake, near the head of Kachemak Bay, provided additional fish for harvest in the 1980's and 1990's, but the program was eliminated and no adults from that project returned after 1997. The regulations governing the fishery are found in the Personal Use Coho Salmon Fishery Management Plan (**5 AAC 77.549**). The BOF last addressed this fishery during it's 1998 meeting in Homer. After hearing the staff's concerns regarding the harvest of wild stocks of coho, the BOF adopted a change to the regulatory guideline harvest range (GHR), from a former range of 2,500 to 3,500 coho salmon to a new range of 1,000 to 2,000 coho. The lower GHR was implemented for the first time during the 1999 season. Incorporated into the management plan is a requirement that coho salmon taken during the earlier Seldovia area subsistence salmon fishery be included as part of the personal use guideline.

All regulations from the previous year's fishery remained essentially unchanged for the 2005 personal use fishery. Legal gear was limited to a single set gillnet not exceeding 35 fathoms in length, 45 meshes in depth, and 6 inches in mesh size. Nets were not allowed more than 500 feet from the mean high water mark, and a net could not be set offshore of another net. A permit from the Homer office was required, with an Alaska resident sport fishing license necessary to obtain a permit. The seasonal limit was 25 salmon per head of household and 10 additional salmon per each dependent. There were two scheduled 48-hour fishing periods each week, from Monday 6:00 a.m. until Wednesday 6:00 a.m. and Thursday 6:00 a.m. until Saturday 6:00 a.m. By regulation the Southern District personal use salmon set gillnet fishery opens August 16. However, because August 16 fell on a day in the middle of a normally open weekly fishing period this year, fishing would have legally begun in darkness at 12:01 a.m. if allowed to open by regulation. Therefore, the opening was delayed by emergency order until 6:00 a.m. Tuesday, August 16, in order to give participants adequate daylight to set gear and allow more efficient enforcement (Table 8). Prior to 1991, little ADF&G management interaction occurred and the fishery often proceeded until the regulatory closing date of September 15, regardless of the harvest level. Between 1991 and 2004, years of intensive management for the GHR, fishing time allowed in this fishery ranged from 72 to 192 hours.

Only 13 coho salmon were reported during the early August Seldovia subsistence fishery, thus having little effect on the later personal use fishery guideline harvest range. Prior to the opening on August 16, ADF&G requested voluntary daily reporting from each permit holder during the fishery, as has been the case since 1991. Catch information collected after the first period (which lasted only 24 hours) as well as the second (48-hour) period indicated a catch of only about 625 coho salmon harvested by 28 (25%) of the 108 permit holders. The catch at this point was slightly more than half the lower end of the 1,000–2,000 coho guideline harvest range, and when compared to historical data, the catch and catch rates were lower than previous years, suggesting a weak coho return. Two more 48-hour fishing periods were allowed the following week, but active effort and harvest rates continued to remain low. Comparing this information to data collected from past personal use fisheries, ADF&G staff projected that a total catch within the GHR was not likely to be attained by the conclusion of the next weekly fishing period, slated to last from Monday, August 29 until Wednesday, August 31. Staff reasoned that additional fishing after that date, however, could result in a significant harvest of wild stock coho salmon bound for systems at the head of Kachemak Bay, because of their later run timing characteristics. Since the Personal Use Coho Salmon Fishery Management Plan and its GHR seek to protect these wild stock fish, the staff issued an emergency order closing the Southern District personal use coho

salmon gillnet fishery at the end of the regularly scheduled weekly fishing period at 6:00 a.m. Wednesday, August 31, for the remainder of the 2005 season (Table 8). Total fishing time allowed this season was 216 hours, or 4.5 regular weekly periods.

A total of 108 permits were issued for the 2005 fishery (Appendix A29), while 96 permit holders (89%) either phoned in their catches or returned their permits. Of the total number issued, 69 permit holders (64%) actively fished, 27 (25%) did not fish at all, and the remaining 12 permit holders (11%) did not report or return their permit. Based on returned permits and voluntary catch reports, the harvest was estimated to be 833 coho, 296 pink, 57 sockeye, 8 Chinook, and 13 chum salmon (Appendix A29). The 2005 coho total represents the lowest catch in the personal use gillnet fishery since 1974.

The number of permits issued for the 2005 personal use fishery (108) was a slight increase over the previous year when 91 permits were issued but still the third lowest total since 1970, well before production from Kachemak Bay coho enhancement programs began contributing to the fishery. The percentage of permits that actually fished, at 64% of the total issued (or 69 of 108 permits), was considerably below the record high of 78% in 1994 and also lower than the recent 10-year average of 71%. Perhaps more importantly, only 27 permits fished on the east side of the Homer Spit this season, compared to an annual average number of 49 permits fished there since 1999. The coho harvest of 833 fish failed to attain the low end of the GHR and represented the lowest catch in over 30 years. This year's coho catch was only about half of the 1,600 fish average annual harvest between 1999 and 2004, years that the personal use fishery was managed for the lower 1,000 to 2,000 coho GHR.

The duration of the 2005 Southern District personal use fishery, at 216 hours of fishing time, was the greatest allowed since intensive management of the fishery began in 1991, and exactly twice the average duration of 113 hours during that same time period. Both the number of permits issued and the active fishing effort increased over the previous 2 years but were still considered low when compared to historical levels (Appendix A29). Reasons for the declining trend in participation are likely due to the popularity of other alternative personal use fisheries in Upper Cook Inlet targeting sockeye salmon. Permits for, and catches in, the personal use fisheries north of Homer (e.g. the Kasilof and Kenai River dip and set gillnet fisheries) have been relatively high in recent years. Since current regulations prohibit issuance of more than one Cook Inlet personal use permit to a household in any calendar year, individuals must choose only one Cook Inlet fishery in which to potentially participate. Many individuals now choose to forego the LCI coho fishery and instead participate in one of the Upper Cook Inlet personal use sockeye fisheries, perhaps due to a preference for sockeye over coho, or perhaps due to a preference for the dip net fishery as opposed to the set gillnet fishery.

In an effort to provide additional sport fishing opportunities and continuity with the earlier return of Chinook salmon to the Nick Dudiak Fishing Lagoon on the Homer Spit, the ADF&G Division of Sport Fish has stocked coho salmon with both early (Ship Creek brood) and late (Bear Lake brood) run timing characteristics since 2001. Adults resulting from the early run release return as early as the third week of July, which roughly coincides with the end of the enhanced Chinook return. The midpoint of the early run coho return is approximately mid-August and closely corresponds with the regulatory opening date of the personal use fishery, while the midpoint of the late run coho return is approximately the end of August. The overlapping run timing windows of the combined early and late coho runs likely tend to increase catch rates in the personal use fishery, particularly during the first 24-hour period.

Due to the abbreviated nature of the personal use fishery since 1991, the staff annually makes a concerted effort prior to the opening to inform the public of the anticipated short duration, which has become common knowledge among experienced local participants. Although this prior knowledge of the brevity of the fishery usually leads to intense competition for desirable fishing sites along the east side of the Homer Spit, the reduced participation in the fishery in recent seasons appears to have tempered this competitive character. Nonetheless, this area continues to remain an extremely popular location to fish, undeniably due to the coho enhancement project at the Nick Dudiak Fishing Lagoon. As expected, the most fishing success this season occurred in those waters adjacent to the enhancement lagoon, but other areas, particularly along the south shore of Kachemak Bay, also produced reasonably good harvests in 2005.

Prior to enhancement, the Spit was considered only average in terms of harvest productivity. The Spit's easy road access and the enhanced coho returns have at times combined to incite fishermen to clamor for fishing sites on the Spit, a situation which resulted in numerous violations during some previous gillnet fisheries. The last time that Alaska Bureau of Wildlife Enforcement (ABWE) officers issued citations during this fishery was in 1994. Since then, numerous verbal warnings have been issued, and many complaints received via telephone in the Homer ADF&G office regarding infractions. This year ABWE officers were once again on site for the beginning of the fishery, and as is usually the case, the presence of these uniformed officials generated relatively expedient voluntary compliance. As a result, no formal citations were issued.

The lower GHR implemented in 1999 appears to have succeeded at protecting the majority of naturally produced coho salmon by prompting a fishery closure prior to the peak of those stocks' migration. Although no tagged adult fish returned to the enhancement lagoon this year, tag recovery analysis from catches along the east side of the Spit during the 1999 and 2000 personal use fisheries indicated that approximately 80% of coho caught in that area were of hatchery origin. This information, when combined with a personal use coho harvest slightly below the 1,000 to 2,000 fish GHR, suggests that relatively small numbers of wild stock fish were presumably taken in the gillnet fishery this year.

Overall run strength of coho returns to Kachemak Bay this year was estimated to be average to slightly below average as indicated by the incidental catch in the commercial fishery. However, commercial coho catches have proven to be an unreliable indicator of overall returns since this species is rarely targeted in that fishery. For example, the coho catch in the commercial fishery for the Southern District this year was over 2,700 fish versus only 1,400 fish for 2004, a year when coho returns to the area were considered excellent. Informal observations conducted in the local sport fishery by Division of Sport Fish staff indicated reasonably strong returns to the enhancement lagoon. This years only aerial survey of Clearwater Creek, the major coho index stream at the head of Kachemak Bay, also suggested good returns of wild stock coho salmon to the area. Approximately 700 coho were estimated on the September 2 survey, a figure considered excellent for this drainage by historical standards.

The 2005 catch of 8 Chinook salmon (Appendix A29) was the second lowest since 1993 and considerably lower than the long term average (1969–2004) of 50 fish. The declining trend observed in the harvest of this species in the personal use fishery over the past several years can clearly be attributed to the discontinuation of the Division of Sport Fish program to stock late run juvenile Chinook salmon after 1999. Because of this, catches of Chinook salmon are expected to remain low in future personal use fisheries.

Catches in the 2006 personal use fishery are expected to be comparable to the previous 7-year period, 1999–2005, a period when adult returns from Caribou Lake enhancement no longer contributed to the fishery. However, the length of time to achieve a harvest within the GHR is difficult to forecast, particularly when comparing this year's relatively long fishery (216 hours) to that of the previous year's 96 hours. Additionally, run timing of the earlier returning stocked coho should hypothetically serve to reduce the length of time needed to achieve a harvest within the GHR. This in turn would provide further protection to the wild stock coho salmon bound primarily for the Fox River drainage at the head of Kachemak Bay, which exhibit later run timing. However, low participation and effort levels in, and thus a longer duration of, the 2006 fishery could easily negate the previous statement. Once again, other alternative personal use fisheries elsewhere in Cook Inlet will likely impact effort levels in the LCI fishery. Although limited as an inseason management tool, voluntary catch reports will once again be employed to help determine an appropriate closure time. Based on experience gained during the past 15 years' fisheries, and especially that of the past seven seasons, management for a harvest within the GHR is considered realistic and likely.

NANWALEK/PORT GRAHAM SUBSISTENCE FISHERY

One of Lower Cook Inlet's two subsistence fisheries during 2005 occurred near the villages of Nanwalek (formerly English Bay) and Port Graham, located approximately 21 nautical miles southwest of Homer on the south side of Kachemak Bay (Figure 2). Gear in this fishery is limited to set gillnets. Most fishing occurs within close proximity to the respective villages, primarily targeting sockeye salmon returning to the English Bay Lakes system early in the summer, although participants will occasionally target pink salmon returning to Port Graham and English Bay Rivers later in the summer. Some additional fishing also occurs in Koyuktolik ("Dogfish") Bay, located about 7 nautical miles south of English Bay, targeting non-local stocks of Chinook salmon as well as local stocks of chum salmon. Despite being open to fishing for each of the past four seasons, waters of Port Chatham and Windy Bay Subdistricts have not experienced any known effort but do provide additional opportunity for participants to meet subsistence requirements.

The sockeye salmon run to English Bay Lakes was severely depressed for much of the late 1980's and early 1990's, with runs failing to achieve the minimum escapement goal for 9 consecutive years between 1985 and 1993 (Appendix A23). More recently, returns have been bolstered in some years as a result of a rehabilitation/enhancement project initiated by ADF&G and subsequently taken over by the Nanwalek Salmon Enhancement Project (NSEP) in conjunction with Chugach Regional Resources Commission (CRRC) and the village of Nanwalek. However, disease outbreaks in the lake-rearing portion of the program, coupled with erratic adult behavior that caused difficulty in capturing broodstock, have plagued the program and led to inconsistent adult returns.

With only 4,000 adult sockeye forecasted to return to English Bay Lakes in 2005, and an established SEG range of 6,000 to 13,500 fish, the commercial set gillnet fishery in waters of Port Graham Subdistrict, including both the Port Graham and English Bay Sections, was kept closed at the start of the commercial season in early June. Additionally, the subsistence set gillnet fishery, which opened in the same waters on April 1, was closed at the end of May until sockeye returns could be assessed. Early weir counts from English Bay River suggested a weak run, but as the run progressed into the month of June, it appeared to be slightly stronger than originally predicted. By the end of the month, the increased counts prompted staff to project that an escapement within the SEG range would be achieved. As a result, subsistence salmon set

gillnet fishing in waters of Port Graham Subdistrict was reopened on the regular weekly fishing schedule beginning June 30. Because of the increased harvesting power of the commercial set gillnet gear group, that fishery was kept closed.

Harvest and effort information in the Port Graham/Nanwalek subsistence fishery is compiled by ADF&G's Division of Subsistence, but no figures were available for the 2005 season at the time of publication. Historical catch and effort figures are found in Appendices A31 and A32. The enumeration weir operated by NSEP at English Bay River monitored sockeye escapement inseason, as has been the case since 1994, with a final estimate of 8,200 fish (Table 3; Appendix A23), falling within the SEG of 6,000–13,500. NSEP normally collects sockeye salmon broodstock for their enhancement program from lake escapement, but in 2005 they elected not to do so for unknown reasons.

Because of sub-par salmon returns to the Port Graham Subdistrict in some recent seasons, village residents have at times encountered difficulty meeting their subsistence salmon needs when restricted to fishing only in the Port Graham and Koyuktolik Subdistricts. Consequently, a proposal to add the previously mentioned waters of Port Chatham and Windy Bay to those areas open to subsistence fishing was submitted to the Alaska Board of Fisheries (BOF) at their November 2001 meeting. The BOF amended and subsequently adopted the proposal, allowing fishing weekly from 10:00 p.m. Thursday to 10:00 a.m. Wednesday between April 1 and September 30 in waters of Port Graham and Koyuktolik Subdistricts. However, in waters of Port Chatham and Windy Bay Subdistricts, the BOF established identical weekly fishing periods but chose season dates for these two subdistricts from April 1 until August 1 to protect returning coho salmon in those waters. No subsistence fishing effort or harvest has been known to occur in Port Chatham or Windy Bay Subdistricts since these areas were first opened to fishing in 2002.

SELDOVIA AREA SUBSISTENCE SALMON GILLNET FISHERY

The set gillnet fishery in waters near Seldovia on the south side of Kachemak Bay in 2005 was the tenth year of Lower Cook Inlet's newest subsistence salmon fishery. Established by the BOF at their LCI meeting in the fall of 1995, the fishery was designed to primarily target non-local stocks of Chinook salmon as they transited these waters. In considering initial seasons and bag limits, the BOF carefully restricted the fishery to reduce potential interception of enhanced Chinook salmon bound for a popular stocking site in the Seldovia small boat harbor. These enhanced fish were intended to principally benefit sport fishermen and were not considered "customary and traditional" for subsistence purposes.

Regulations in the fishery included a "split" season, the first occurring from April 1 through May 30 and the second occurring during the first 2 weeks of August. A guideline harvest limit of 200 Chinook salmon was established for the early season, while the annual possession limit was set at 20 Chinook per household. During the April/May season, fishing was allowed during two 48-hour periods each week, while in August the fishery was only open during the first 2 weekends of the month. Waters open to fishing included those along the eastern shore of Seldovia Bay as well as a short stretch of water outside of Seldovia Bay proper just west of Point Naskowhak (also called the "outside beach"). Gear was limited to set gillnets not exceeding 35 fathoms in length, 45 meshes in depth, and 6 inches (stretched) mesh size, identical to gear regulations governing the nearby Port Graham/English Bay subsistence fishery. A permit issued by ADF&G was required prior to fishing, and catches were to be recorded on the permit and also reported to ADF&G's Homer office inseason so that cumulative harvest totals could be monitored.

A total of 15 permits were issued for the early season, while 2 permits were issued for the August season. Because most fishermen ignore the requirement to call in their catches during the open season, inseason harvests are typically underreported. At the close of the early season, 13 of the 15 permits were returned to ADF&G as required by regulation, and catches were determined from records on each permit. For the early season, 4 of 15 permit holders (27%) actively fished, 9 (60%) did not fish, and 2 permit holders (13%) failed to return his/her permit (Appendix A33). The reported salmon catch for the early season totaled only 46 Chinook salmon (Appendix A33), while in the late season, 2 of the 3 permit holders reported a harvest of 70 sockeye, 93 pink, 12 chum and 13 coho salmon.

The 2005 early season Seldovia subsistence harvest of only 46 Chinook salmon was the lowest catch since the fishery was established (Appendix A33). Uncharacteristically, no other salmon species were reported caught during the early season for the first time since the fishery began in 1996. The low Chinook catch is likely due in part to the low number of participants who actually fished, with only 4 permit holders actively fishing in 2005, compared to 9 that fished last season. The complete lack of sockeye salmon harvest in the early season might be explained by the weak return of that species to nearby English Bay Lakes this year. The record catch for both species in the Seldovia subsistence fishery occurred in 2000 when 189 Chinook and 249 sockeye salmon were harvested (Appendix A33).

The harvest in the 2006 Seldovia early season subsistence fishery is difficult to predict given the low participation in the 2005 fishery. If the number of actively fishing permit holders increases next year to pre-2005 levels, then harvests could increase commensurately. However, the elevated late season harvest during 2005 might also induce more fishermen to participate in that fishery next year, keeping the early season harvest low.

2005 COMMERCIAL HERRING FISHERY

INTRODUCTION

Similar to the salmon fishery, commercial Pacific herring *Clupea pallasi* fishing in LCI has historically occurred in four of the five management districts, with the Barren Islands District the sole area where commercial herring fishing has not occurred (Figure 1). LCI herring fishing first began in the Southern District in 1914 with the development of a gillnet fishery within Kachemak Bay. Eight saltries, including six near Halibut Cove, were operating during the peak of the fishery. A purse seine fishery in Kachemak Bay began in 1923, but after 3 successive years of average annual harvests approaching 8,000 short tons (st; 1 short ton = 2,000 pounds), herring populations, and hence the fishery, collapsed.

The next LCI herring fishery began in 1939 and was centered in the Resurrection Bay and Day Harbor areas of the Eastern District (Figure 1). Product from this purse seine fishery was used exclusively for oil and meal reduction. Although the fishery continued through 1959, peak harvests occurred from 1944 to 1946, averaging 16,000 st each of those years. After this time period, stocks sharply declined, apparently due to over-exploitation.

HISTORY AND DEVELOPMENT OF THE SAC ROE FISHERY

Introduction

Japanese market demand for salted herring roe resulted in the development of a sac roe fishery in the 1960s. The relatively high prices paid to fishermen caused rapid expansion of the fishing

fleet and harvest, and efforts to manage the resource frequently encountered difficulty keeping pace with this strong market demand and growth. In order to decrease the risk of a stock collapse and to sustain the fishery, ADF&G established conservative management strategies and guideline harvest levels. Following a period of suspected over-exploitation, herring stocks throughout LCI generally declined after 1973. Concern over the declining trend led the Alaska Board of Fish and Game, prior to the start of the 1974 season, to establish a quota of 4,000 st for all of LCI.

Historically the only allowable gear type in the LCI herring sac roe fishery has been purse seine. The limited entry permit system for sac roe herring seining in Cook Inlet was implemented in 1977, and at the present time 74 permanent and 2 interim use permits are issued for the management area.

Outer/Eastern Districts

During the early years of sac roe herring fishing in LCI, seining occurred primarily in the Outer and Eastern Districts (Figure 1), with the majority of effort and harvest once again concentrated in Resurrection Bay of the Eastern District. The first major harvest occurred in 1969, when 760 st of herring were taken in the Eastern District. The catch increased dramatically in 1970 to a record high of 2,100 st in this district, but the stocks, and resultant harvests, declined over the next three seasons. The Alaska Board of Fish and Game allocated 1,000 st from the total LCI quota of 4,000 st to each of the Outer and Eastern Districts beginning with the 1974 season. However, stock abundance continued to decline and these quotas were never achieved. As a result, the Outer and Eastern Districts were closed to herring fishing from 1975 to 1984.

In 1985, the sac roe fishery was allowed to resume in the Outer and Eastern Districts on a very conservative basis, even though no noticeable change in spawning biomass had been observed. Because of the stocks' reduced abundance and extreme vulnerability to fishing, guideline harvest levels were set at 150 to 200 st for each of the four fishing areas created within these two districts. Fishing effort in 1985 was minimal and the majority of the harvest (216 st) once again was taken in Resurrection Bay. Only limited and sporadic harvests occurred in these two districts after 1985, with the majority of both the herring catch and the observed biomass comprised of fish age 4 and younger.

Despite considerable opportunity for exploratory fishing on a daily basis in the Outer and Eastern Districts during 1991 and 1992, the predominance of juvenile herring and the history of marginally acceptable roe recoveries from fish caught in these areas contributed to a lack of interest by fishermen and processors. These conditions prevailed from 1993 through 2001 and, consequently, the Outer and Eastern Districts were not opened to purse seining in any season during that 9-year period. At their November 2001 meeting, the Alaska Board of Fisheries (BOF) closed these districts to commercial herring fishing by regulation and simultaneously adopted a management plan containing seven specific criteria that must be addressed prior to allowing any commercial herring fishing in the Outer and/or Eastern Districts. Thus, no harvest or effort occurred in the Outer and Eastern Districts during the 2005 season.

Southern District

Sac roe herring seining in the Southern District began in the early 1960s, but catches were sporadic and relatively insignificant until 1969. That year, over 550 st were taken, followed the next season by a district record high harvest of 2,700 st. Commercial harvests continued during

the 1970's, albeit at much lower levels, but observed low abundance of herring during the past 25 years has virtually precluded commercial openings in the Southern District. The only exception occurred in 1989, when 10 vessels in a single 2.5-hour opening harvested 170 st of herring (Appendix B1) averaging 8.9% roe recovery.

Similar to the Outer and Eastern Districts, the BOF expressed concern for the herring stock in the Southern District and responded at their November 2001 meeting by closing the Southern District to commercial fishing by regulation, including it in the previously mentioned management plan adopted for the Outer and Eastern Districts. Under the new plan, the BOF must address seven specific management considerations prior to allowing a commercial herring fishery in this district.

Kamishak Bay District

Since 1973, the majority of LCI sac roe herring harvest and effort has occurred within the Kamishak Bay District (Figures 1 and 7). Historical commercial harvests ranged from a low of 240 st taken in 1973 to a high of 6,100 st taken in 1987 (Appendix B1), with estimated exvessel values ranging from $70,000 to $9.30 million (Appendix B2). After the initial harvest in 1973, Kamishak Bay herring catches increased dramatically over the next 3 years, peaking at 4,800 st in 1976. Harvests dropped sharply during the ensuing three seasons, and by the end of the decade the stock had declined to a point that the Kamishak Bay fishery was closed entirely beginning with the 1980 season.

Although the Kamishak Bay District herring season remained relatively constant during the 1970's, roughly from late April through June, a significant management change occurred during this time. From 1973 through 1977, the fishery was essentially "open season until closed", but in 1978 it was changed to "closed season until opened by emergency order" (Appendix B3). This change required more active assessment of the herring stock by ADF&G in order to determine appropriate opening times and harvest levels.

The Kamishak Bay herring stock appeared to respond positively and rebuild rather quickly following the 5-year closure that began in 1980. The fishery was reopened in 1985, with a resulting harvest of 1,100 st that season (Appendix B4). Beginning in 1985, the commercial fishery in Kamishak Bay District was regulated to achieve a 10% to 20% exploitation rate mandated by the Board of Fisheries. From 1985 through 1989, harvests averaged about 3,900 st, with a peak catch of 6,100 st in 1987 (Appendix B1). By 1989, fishing efficiency had increased to a level where intensive regulatory management was required to maintain harvests within guideline levels, to direct the fishery at herring aggregations with high quality roe, and to protect younger age herring from harvest.

Management of the Kamishak Bay District between 1990 and 1997 stabilized the average harvest at roughly 40% of the 1987 record high catch. However, hindcast biomass estimates generated by an age-structured-assessment (ASA) model show that stocks were declining steadily throughout the decade (Figure 13; Appendix B4), and by 1998 the cumulative commercial herring catch in the Kamishak Bay District totaled only 300 st despite several extended district-wide openings. The fishery was closed beginning with the 1999 season due to low abundance levels and has remained closed since.

The initial Kamishak Bay District Herring Management Plan (KBDHMP) was formally adopted into regulation beginning with the 1993 season. Highlights of the original plan included a

minimum biomass threshold of 8,000 st, a maximum exploitation rate of 20% (scaled depending on the forecasted biomass), and a management strategy intended to limit the harvest of herring age 5 and younger. In addition, because the spawning stock of Kamishak Bay herring is believed to reside in waters of north Shelikof Strait in the Kodiak Management Area for at least a part of the year, the KBDHMP dictated that 10% of the allowable harvest of Kamishak Bay herring be allocated to the Shelikof food/bait fishery.

At the November 2001 BOF meeting, ADF&G staff proposed amendments to the KBDHMP in order to make it more conservative. The two key components of the new plan included a reduction in the maximum exploitation rate allowed in the fishery, from a former level of 20% of the forecasted herring biomass to a new level of 15%, and a reduction in the biomass threshold (the minimum volume necessary in order to allow a fishery) from 8,000 st to 6,000 st. The staff reasoned that the decreased exploitation rate, although equating to a smaller annual harvest for the fleet, would help to preclude the extended closures that have plagued the Kamishak Bay commercial herring fishery since its inception. The new threshold level was the result of a biomass threshold analysis conducted by the LCI research staff (Hammarstrom and Otis 2001). After careful review, the BOF unanimously adopted the amended KBDHMP into regulation.

2005 HERRING SEASON OVERVIEW

Assessment Methods

The primary method of herring biomass assessment in LCI is the aerial survey. Aerial surveys are conducted annually throughout the herring spawning season in the Kamishak Bay and Southern Districts, from late April through early June, to determine relative abundance and distribution of herring. Because a commercial herring fishery has not occurred in the Outer and Eastern Districts in many years, and is not likely to occur in the near future, aerial surveys of these areas are no longer conducted. Additionally, the size of the area and the characteristically poor weather in the Gulf of Alaska precludes surveys on a regular basis and makes aerial biomass estimation in these districts impractical and expensive. Data collection methods in the Kamishak Bay and Southern Districts are consistent between seasons, with numbers and distribution of herring schools, location and extent of spawning events and milt, and visibility factors affecting survey results recorded on index maps for each survey. Three standard conversion factors are used to estimate herring biomass based on each 538 ft^2 (50 m^2) of school surface area sighted and the following water depth parameters: 1) 1.52 st for water depths of 16 ft or less; 2) 2.56 st for water depths between 16 and 26 ft; and 3) 2.83 st for water depths greater than 26 ft (Lebida and Whitmore 1985).

Due to invariably poor weather and water clarity, aerial surveys rarely provide reliable estimates of total herring biomass returning to Kamishak District Bay waters (Otis et al. 1998). As a result, an age-structured-assessment (ASA) model has been used for the past 12 years to forecast herring abundance for Kamishak Bay, as well as to “hindcast” previous years’ total abundance. This dynamic model incorporates a variety of heterogeneous data sources including: a time series of commercial catch age composition; total run age composition; and aerial survey biomass estimates from years with adequate survey conditions and coverage. The model simultaneously minimizes the differences between expected and observed return data for each of its components, updates hindcasts of previous years’ abundance, and returns a forecasted estimate of the following year’s return.

Another tool ADF&G annually utilizes to aid in herring assessment in the Kamishak Bay District, and opportunistically in the Southern District, is a chartered commercial seine vessel. In years when no commercial fishery occurs, ADF&G is unable to utilize the fleet to collect samples for age composition analysis. By chartering a commercial purse seine vessel, samples and other related information can be collected and used to further aid in understanding the dynamics of the herring stocks. As long as sufficient funding is available, separate sampling charters are conducted to sample different portions of the spawning migration (early and late). In years when a fishery occurs (traditionally in the early part of the migration), a single "late season" sampling charter is employed to obtain a more complete picture of the overall return. Hydroacoustic observations and water temperature/depth parameters are concurrently accumulated during the charters. The information gathered during these sampling efforts provides age class data that: 1) allows the staff to generate an age composition estimate of the overall biomass observed by aerial surveyors throughout the entire duration of the spawning migration; and 2) facilitates the evaluation of the relative strength of recruiting year classes. This is critical in generating the annual herring forecast. The charters further serve to informally verify the relative magnitude of herring biomass observed by aerial surveyors.

Kamishak Bay District 2005 Season Summary

Aerial survey coverage for Kamishak Bay in 2005 was considered fair to poor, while overall observation conditions were considered fair. A total of 11 surveys were completed in the Kamishak Bay District between April 15 and June 2. Several 7 to 9 day "gaps" in coverage, or periods during which no surveys were flown due to poor weather, occurred in 2005. Based on historical observations, the arrival of herring in 2005 was considerably later than normal for the district, with fish first documented during a survey on May 4 when less than 2 tons were estimated in Iniskin Bay. The highest daily biomass estimation during the seasonal surveying period was made on May 23, with a cumulative estimate of about 418 st made on that date. Just over 60% of that survey's total biomass was observed in the Iniskin Bay index area, in the north end of the district, followed by the Ursus Cove area with about 21% of the total.

No sightings of spawning activity occurred during surveillance flights in 2005, considered abnormal by recent standards. Due to the often sporadic schedule of surveillance flights, however, correlation between documented spawning and herring abundance has traditionally not been attempted. Therefore, the lack of spawn sightings this year certainly substantiates the low abundances observed but is not in itself considered indicative of a weak herring return.

The relatively poor assessment coverage in 2005 resulted in a cumulative total of less than 1,450 st of herring observed by ADF&G surveyors in the Kamishak Bay District this season, which was more than 2004's record low of 900 st but still the second lowest observed total in the past 16 seasons. The last 5 consecutive years of disappointingly low aerial survey abundance indices indicate the lack of a significant herring recruitment event in Kamishak Bay during any recent season. This contrasts with other North Gulf of Alaska herring populations, such as those in the Kodiak management area, which have experienced population growth due to strong recruitment events in recent years. One hypothesis for the lack of recruitment in Kamishak Bay originates from the relatively poor condition of the fish observed recently, characterized by low average weights-at-age, which can lead to higher than normal mortality. Furthermore, a surprisingly high percentage (37–52%) of herring collected in Kamishak Bay in mid-May 2005 was positive for Ichthyophonus, a protozoan pathogen that has been linked to population declines of Atlantic herring. Another theory speculates that herring may not always return to their birthplace to

spawn. This premise is based on the concept that, upon first achieving sexual maturity, the younger herring may simply follow older repeat spawners in a given school back to a spawning area, even if that area is not where the younger fish were originally spawned.

Reasonably good weather once again contributed to successful coverage by ADF&G's two spring vessel charters to collect age composition samples during the periods April 29–May 7 and May 15–22. The early sampling period coincided with the arrival of the first fish on the grounds, which in turn corresponds to the traditional timing of the commercial fishery, while the second charter collected age composition samples during the latter portion of the return in 2005. During the 18 days spent in the district, the contracted vessel collected nearly 1,700 fish for age, weight, and length (AWL) analysis. Unfortunately, information and samples collected from the two charters corroborated the overall low abundance of the population observed by ADF&G aerial surveyors, while additionally confirming the low recruitment of new fish.

Based on hindcast estimates, herring biomass steadily declined in Kamishak Bay between 1985 and 2001 and has now stabilized at a very low level over the past 5 years. The ASA model estimated the total 2005 return at just over 2,300 st (Table 11; Figure 13; Appendix B4), the lowest figure in the past two decades. Recruitment into the spawning population did occur in 2005, but the magnitude of this recruitment was not as great as was hoped. Nonetheless, postseason data analysis of test fishing samples indicate that the overall return this season was dominated by fish age 4, age 6, and age 9 at 23.4%, 20.0%, and 13.1% of the biomass by weight, respectively (Table 11; Figure 14). While the 1996 and 1997 cohorts each appeared relatively strong at approximately 9–13% of the total biomass, they were estimated to be less than one-quarter of the size of the very strong 1988 cohort that supported the commercial fishery throughout most of the 1990s.

Southern District 2005 Season Summary

A total of five aerial surveys of the Southern District were flown between May 3 and May 25 in 2005, all conducted under reasonably good conditions. The 2005 run biomass, estimated as the sum of all daily biomass estimates, totaled 1,117 st, which was considerably greater than the previous 2 years' estimates. The low number of surveys conducted this season was similar to the total of four flown in each of the previous two seasons, yet the biomass figure for 2005 was higher than the paltry 397 st and 558 st observed in 2003 and 2004, respectively. Nonetheless, the observed total continued to follow a pattern of low herring abundances in the Southern District over the past two decades. The peak 2005 individual biomass survey (501 st) occurred on May 25, with the majority of herring observed that day on the west side of the Homer Spit. Peak surveys in areas where herring historically have been observed were as follows: Mallard Bay, 79 st on May 25; and Glacier Spit/Halibut Cove, 406 st on May 3. Uncharacteristically, no fish were documented on the east side of the Homer Spit and in Mud Bay in 2005. As has been the persistent trend over the past two decades, low abundance levels in the Southern District, combined with the recently adopted regulatory management plan mentioned previously, precluded any commercial fishing during the 2005 season.

Outer/Eastern District 2005 Season Summary

As in previous recent seasons, no herring assessment occurred in the Outer and Eastern Districts during 2005. Unlike the Southern and Kamishak Bay Districts, historical samples from the Outer and Eastern Districts have contained up to 14% age-2 (sexually immature) herring. Formal sampling has not occurred in recent years and was very limited in previous years. However, two

small, informal samples of herring from two separate schools observed aerially in Day Harbor (Eastern District, late June) and Port Dick (Outer District, early July) were obtained by handline jigging during the 2000 season. Scales were not collected for age composition analysis, but the size of all fish caught suggested that they were age-2 juveniles. No discernible shift to older age herring has ever been observed in this area, suggesting the possibility that the Outer and Eastern Districts may be feeding and rearing grounds for juvenile fish from another area.

2006 HERRING SEASON OUTLOOK

Kamishak Bay District

The forecasted herring biomass generated by the ASA model for 2006 in the Kamishak Bay District is 2,650 st (Table 11; Figure 13; Otis *In prep* a). This total falls below the KBDHMP regulatory threshold of 6,000 st for which a commercial harvest can be considered. Additionally, nearly 60% of the predicted return by weight in 2006 should be comprised of fish age 5 and younger, with the single age 3 year class projected to make up approximately 30% of the overall return (Table 11; Figure 14). Since the KBDHMP directs ADF&G to limit the harvest of fish age 5 and younger, and because the forecasted abundance falls below threshold, the sac roe fishery in the Kamishak Bay district will remain closed for the 2006 season. The resource, and hence the commercial fishery, is best served by protecting the remaining spawning population in order to rebuild it to a harvestable level.

Without a commercial fishery in 2006, ADF&G's ability to collect age composition information will be greatly reduced. ADF&G expects to once again obtain samples using a chartered commercial seine vessel throughout the duration of the 2006 run, with sufficient funding expected for both an early and a late season charter. ADF&G will also attempt to conduct comprehensive aerial surveys throughout the spawning season, from mid-April to early June, as conditions permit.

Other Districts

Based on the persistent trend of low herring abundance in the Southern District and a historical preponderance of juvenile herring in the Outer and Eastern Districts, as well as the stipulations contained within the Eastern, Outer, and Southern Districts Management Plan, the commercial herring fishery in these areas will remain closed during 2006. Monitoring of the Southern District herring stocks will occur as in the past through the use of aerial surveys, possibly in conjunction with test fish sampling conducted on an opportunistic basis.

RECENT HERRING RESEARCH IN LOWER COOK INLET

Two additional research projects were recently completed, and another begun, to better understand Kamishak Bay herring stock structure and its relationship to other North Gulf of Alaska herring stocks. The KBDHMP dictates that 10% of the allowable harvest for Kamishak Bay be allocated to the Shelikof food/bait fishery because it appears these two stocks mix during part of the year around the north end of Shelikof Strait (Johnson et al. *Unpublished*). The extent to which these stocks intermix is poorly understood, however, and the ramifications of their mixing complicate the assessment and management of each stock. Therefore, in 2001 ADF&G successfully applied for a grant from the Exxon Valdez Oil Spill Trustee Council (EVOS-TC) to investigate the feasibility of using two relatively new stock identification techniques, fatty acid composition of heart tissue and elemental composition of otoliths, to distinguish among several Alaska herring stocks. Representative samples were collected from Sitka, Prince William Sound,

Kamishak, Kodiak, and Togiak spawning aggregations during the spring of 2001. Chemical analysis of those samples was completed during 2002. Results showed that fatty acid composition of heart tissue has the potential to become a reliable stock identification biomarker. Using discriminate analysis, 157 of the 163 samples taken were correctly identified to their original herring stock. Unfortunately, stocks within the North Gulf of Alaska could not be reliably distinguished using the elemental composition of otoliths (Otis and Heintz 2003).

The second research project undertaken by ADF&G also stems from an alternative funding source. In 2002, the National Marine Fisheries Service funded an ADF&G project to synthesize all of the historical Kamishak Bay herring stock assessment and commercial fishery data into a geo-referenced database. Much of this historical information, dating back to 1973, previously existed only in hard copy form on aerial survey field maps. ADF&G captured those data into electronic maps, making them available for a variety of more in-depth analyses. Otis and Spahn (2003) reported on the results of this project, and the completed database (ADF&G 2002) is available on CD-ROM.

The latest research project is a follow-up to the promising pilot study that demonstrated the ability to discriminate Alaska's herring stocks at relatively fine spatial scales (> 100 km) based on the fatty acid composition of heart tissue. This project will attempt to assess the temporal stability and biological variability of stock discrimination criteria derived from fatty acid analysis of herring cardiac tissues. Samples have been and will be collected during the spring and fall/winter of 2005 and 2006 from putative herring stocks from Sitka, PWS, Kamishak, Kodiak, Dutch Harbor, Togiak, and Kuskokwim Bay. Results should allow managers to better define ecologically significant stock boundaries, which would likely affect how commercially exploited herring populations are assessed and managed. Results will be published in a peer-reviewed report and may lead to revision of fishery management plans for affected areas.

ACKNOWLEDGEMENTS

2005 DIVISION OF COMMERCIAL FISHERIES STAFF

The finfish operations for the Division of Commercial Fisheries in Lower Cook Inlet employed 5 permanent full-time employees and 8 permanent/seasonal employees in various area management and research programs during the 2005 season. Appreciation is extended to all personnel for a successful program during 2005.

Permanent Employees during the 2005 season:

Lee Hammarstrom	Area Finfish Management Biologist
Mark Dickson	Fish & Wildlife Technician IV
Edward O. "Ted" Otis	LCI Finfish Research Project Leader
Marnee Beverage	Program Technician
Mark Hottmann	Boat Officer III

Seasonal Employees:

Greg Demers	Fish & Wildlife Technician III
Carla Armstrong	Fish & Wildlife Technician III
Robert "Bo" Fusco	Fish & Wildlife Technician III
Sigfus T. "Tom" Sigurdsson	Fish & Wildlife Technician II
Star Ames	Fish & Wildlife Technician II
Sid Wolford	Vessel Technician II
Josh Mumm	Boat Officer I
Carolyn Bunker	Administrative Clerk II

REFERENCES CITED

ADF&G (Alaska Department of Fish and Game). *Unpublished*. Kamishak Bay Data Synthesis, Version 1.0, 13 December 2002, CD-ROM. Alaska Department of Fish and Game, Division of Commercial Fisheries, Homer.

Commercial Fisheries Entry Commission. *Unpublished*. License Statistics, 1974–2005, Juneau.

Edmundson, J. A., G. B. Kyle, and T. Balland. 1992. Rearing capacity, escapement level, and potential for sockeye salmon (*Oncorhynchus nerka*) enhancement in English Bay Lakes. Alaska Department of Fish and Game, Fisheries Enhancement and Rehabilitation (FRED) Division, Report No. 120.

Hammarstrom, L. F. and E. O. Otis. 2001. Overview of the Lower Cook Inlet area commercial herring fishery and recent stock status, a report to the Alaska Board of Fisheries. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report No. 2A01-17, Anchorage.

Johnson, B. A., C. Burkey, and D. Gaudet. *Unpublished*. Stock identification of Pacific herring in the bait fishery in Shelikof Strait, Alaska, 1985-86. Alaska Department of Fish and Game, 1988 report.

Lebida, R. C., and D. C. Whitmore. 1985. Bering Sea aerial survey manual. Alaska Department of Fish and Game, Bristol Bay Data Report No. 85-2.

Otis, E. O. 2004. Abundance, age, sex, and size statistics for Pacific herring in Lower Cook Inlet, 1995-1999. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report No. 2A04-14, Anchorage.

Otis, E. O. *In prep* a. Forecast of the Kamishak herring stock in 2006. Alaska Department of Fish and Game, Fishery Data Series, Anchorage.

Otis, E. O. *In prep* b. Lower Cook Inlet pink salmon forecast for 2006. Alaska Department of Fish and Game, Fishery Data Series, Anchorage.

Otis, E. O., W. R. Bechtol, and W. A. Bucher. 1998. Coping with a challenging stock assessment situation: the Kamishak Bay sac-roe herring fishery. Pages 557-573 *In* Fishery Stock Assessment Models: Proceedings of the International Symposium on Fishery Stock Assessment Models for the 21st Century, October 8-11, 1997, Anchorage, Alaska. editiors Funk, F., T. J. Quinn, J. Heifetz, J. N. Ianelli, J. E. Powers, J. F. Schweigert, P. J. Sullivan, and C. I. Zhang. University of Alaska Sea Grant College Program AK-SG-98-01.

Otis, E. O., and R. Heintz. 2003. Evaluation of two methods to discriminate Pacific herring (*Clupea pallasi*) stocks along the northern Gulf of Alaska. Exxon Valdez Oil Spill Restoration Project Final Report (Restoration Project 02538), Alaska Department of Fish and Game, Division of Commercial Fisheries, Homer.

Otis, E. O. and M. Spahn. 2003. Improving access to ADF&G's Lower Cook Inlet Pacific herring stock assessment and commercial fishery databases, including observations of Steller sea lions. National Marine Fisheries Service, Steller Sea Lion Research Initiative Final Report (NOAA Award NA16FX1411), Alaska Department of Fish and Game, Division of Commercial Fisheries, Homer.

Otis, E. O. and J. L. Cope. 2004. Abundance, age, sex, and size statistics for Pacific herring in Lower Cook Inlet, 2000-2003. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report No. 2A04-04, Anchorage.

Yuen, H. J. 1994. A model to predict Pacific herring age composition in early and late spawning migrations in Kamishak Bay, Alaska. Alaska Fishery Research Bulletin 1:35-54.

TABLES AND FIGURES

Table 1.–Commercial, hatchery, and derby salmon catches in numbers of fish by species, district, and gear type, Lower Cook Inlet, 2005.

District Harvest Type Gear Type	Chinook	Sockeye	Coho	Pink	Chum	Total
Southern						
Commercial						
Set gillnet	525	15,669	1,905	341	1,326	19,766
Purse seine	96	65,333	816	32,201	422	98,868
Hatchery						
Purse seine	0	29,737	1	2,142,844	2	2,172,584
Total	***621***	***110,739***	***2,722***	***2,175,386***	***1,750***	***2,291,218***
Outer						
Commercial						
Purse seine	***0***	***1***	***3***	***110,195***	***12,524***	***122,723***
Eastern						
Commercial:						
Purse seine	0	19,297	3	13,072	385	32,757
Hatchery:						
Purse seine	0	5,999	0	0	0	5,999
Weir	0	31,655	1,518	428[a]	0	33,601
Derby[b]						
Hook & Line			4,788			4,788
Total	***0***	***56,951***	***6,309***	***13,500***	***385***	***77,145***
Kamishak Bay						
Commercial						
Purse seine	1	50,018	92	5,787	83,943	139,841
Hatchery						
Purse seine		14,969		1,974		16,943
Total	***1***	***64,987***	***92***	***7,761***	***83,943***	***156,784***
LCI Total	**622**	**232,678**	**9,126**	**2,306,842**	**98,602**	**2,647,870**
Percent	0.02%	8.79%	0.34%	87.12%	3.72%	100.00%
1985-2004 Average	1,451	276,537	11,994	1,265,089	57,627	1,612,698

Note: Figures for 2005 do not include a very small number of fish caught during commercial fishing periods but not sold (i.e. retained for personal use).

[a] Harvest of pink salmon authorized by ADF&G, specifically for scientific testing by Alaska Department of Environmental Conservation.

[b] Derby catches are fish entered into the Seward Silver Salmon Derby that are subsequently sold to a commercial processor, therefore these catches are considered part of the LCI "commercial harvest."

Table 2.–Commercial Chinook salmon catches and escapements in numbers of fish by subdistrict or section, Lower Cook Inlet, 2005**.**

Subdistrict/System	Catch	Escapement[a]	Total Run
SOUTHERN DISTRICT			
Halibut Cove			
Common Property (seine)	37		
Common Property (set gillnet)	329		
Total Catch			366
China Poot Bay (seine)	52		52
Neptune Bay (seine)	4		4
Tutka/Kasitsna Bays			
Common Property (seine)	3		
Common Property (set gillnet)	110		
Total Catch			113
Barabara Creek (set gillnet)	20		20
Seldovia Bay (set gillnet)	66		66
SOUTHERN DISTRICT TOTAL	**621**		**621**
OUTER DISTRICT TOTAL	**0**		**0**
EASTERN DISTRICT TOTAL	**0**		**0**
KAMISHAK BAY DISTRICT			
Iniskin Bay	1		1
KAMISHAK BAY DISTRICT TOTAL	**1**		**1**
TOTAL LOWER COOK INLET	**622**		**622**

Note: Figures for 2005 do not include a very small number of fish caught during commercial fishing periods but not sold (i.e. retained for personal use).

[a] Chinook escapement in Lower Cook Inlet is very limited; no escapement surveys are conducted.

Table 3.–Commercial sockeye salmon catches (including hatchery cost recovery) and escapements in numbers of fish by subdistrict or section, Lower Cook Inlet, 2005.

Subdistrict/System	Catch	Escapement[a]	Total Run
SOUTHERN DISTRICT			
Humpy Creek		51	51
Halibut Cove			
Common Property (seine)	3,901		
Common Property (set gillnet)	3,714		
Total Catch			7,615
China Poot Bay			
Common Property (seine)	40,333		
Hatchery Cost Recovery	22,050		
China Poot Creek		1[b]	
Total			62,384
Neptune Bay			
Common Property (seine)	20,515		
Hatchery Cost Recovery	7,687		
Total Catch			28,202
Tutka/Kasitsna Bays			
Common Property (seine)	581		
Common Property (set gillnet)	5,671		
Total Catch			6,252
Barabara Creek (set gillnet)	2,884		2,884
Seldovia Bay			
Common Property (seine)	3		
Common Property (set gillnet)	3,400		
Seldovia River		24	
Total			3,427
English Bay Lakes		8,188[c]	8,188
SOUTHERN DISTRICT TOTAL	**110,739**	**8,264**	**119,003**
OUTER DISTRICT			
Port Dick (South Section) / Creek	1	3	4
East Nuka Bay			
Delight Lake		15,200[d]	
Desire Lake		4,820	
Delusion Lake		1,090	
Total			21,110
OUTER DISTRICT TOTAL	**1**	**21,113**	**21,114**
EASTERN DISTRICT			
Aialik Bay & Aialik Lake	279	5,250	5,529

-continued-

Table 3.–Page 2 of 2.

Subdistrict/System	Catch	Escapement[a]	Total Run
EASTERN DISTRICT (cont'd)			
Resurrection Bay North			
Common Property (seine)	19,018		
Hatchery (seine)	5,999		
Hatchery (weir–sold)	30,353		
Hatchery (weir–donated)	1,302		
Bear Lake Escapement		10,285[e]	
Hatchery Broodstock		3,122[f]	
Bear & Salmon Creeks		10	
Total Run			70,089
EASTERN DISTRICT TOTAL	**56,951**	**18,667**	**75,618**
KAMISHAK BAY DISTRICT			
Iniskin Bay	4		4
Cottonwood/Iliamna Bays	85		85
Kirschner Lake			14,969
Hatchery Cost Recovery	14,969		
Unharvested fish		1,500[b]	
Total Run			16,469
Bruin Bay/ Bruin Bay River		20	20
Chenik Lake	47,013		
Amakdedori Creek		1,710	
Chenik Creek/Lake		14,507[g]	
Total			63,230
Paint River		2,000[b]	2,000
McNeil Cove/Mikfik Lake & Creek		5,970	5,970
Kamishak Bay			
Big Kamishak River		3,900	
Little Kamishak River		10	
Strike Creek		10	
Total			3,920
Douglas River/Silver Beach	2,916		2,916
KAMISHAK BAY DISTRICT TOTAL	**64,987**	**29,627**	**94,614**
TOTAL LOWER COOK INLET	**232,678**	**77,671**	**310,349**

Note: Figures for 2005 do not include a very small number of fish caught during commercial fishing periods but not sold (i.e. retained for personal use).

[a] Escapement estimates derived from limited aerial surveys; numbers represent unexpanded aerial live counts unless otherwise noted.

[b] No freshwater escapement, prevented by barrier falls.

[c] Weir counts for English Bay Lakes include 7,582 sockeye actually counted and an estimated 606 sockeye that entered the lake system during periods when the weir was not operational.

[d] Delight Lake escapement estimate derived from a combination of weir and aerial counts.

[e] Weir counts for Bear Lake sockeye include 13,407 sockeye actually counted, minus the broodstock harvest of 3,122 fish (taken from lake escapement).

[f] Hatchery broodstock figure for Bear Lake sockeye includes 184 mortalities.

[g] Chenik Lake escapement estimate derived from a combination of weir and video counts.

Table 4.–Commercial coho salmon catches (including hatchery cost recovery and sport derby sold to commercial processors) and escapements in numbers of fish by subdistrict or section, Lower Cook Inlet, 2005.

Subdistrict/System	Catch	Escapement[a]	Total Run
SOUTHERN DISTRICT			
Northshore Subdistrict/Clearwater Slough		700[b]	700
Halibut Cove			
Common Property (seine)	21		
Common Property (set gillnet)	314		
Total Catch			335
China Poot Bay (seine)	702		702
Neptune Bay (seine)	82		82
Tutka/Kasitsna Bays			
Common Property (seine)	11		
Common Property (set gillnet)	794		
Total Catch			805
Barabara Creek (set gillnet)	679		679
Seldovia Bay (set gillnet)	118		118
Port Graham (Hatchery seine)	1		1
SOUTHERN DISTRICT TOTAL	**2,722**	**700**	**3,422**
OUTER DISTRICT			
Port Dick (South Section)	3		3
OUTER DISTRICT TOTAL	**3**		**3**
EASTERN DISTRICT			
Aialik Bay	3		3
Resurrection Bay North			
Hatchery Harvest (donated)	1,518		
Sport Derby[b]	4,788		
Bear Lake Escapement (weir)		3,317	
Hatchery Broodstock		663	
Total			10,286
EASTERN DISTRICT TOTAL	**6,309**	**3,980**	**10,289**
KAMISHAK BAY DISTRICT			
Cottonwood/Iliamna Bays	92		92
KAMISHAK BAY DISTRICT TOTAL	**92**		**92**
TOTAL LOWER COOK INLET	**9,126**	**4,680**	**13,806**

Note: Figures for 2005 do not include a very small number of fish caught during commercial fishing periods but not sold (i.e. retained for personal use).

[a] Coho escapement estimates in Lower Cook Inlet are very limited; 1 escapement survey was conducted during 2005, escapement figure represents unexpanded peak aerial live count.

[b] Fish entered into the Seward Silver Salmon Derby are subsequently sold to a commercial processor and are therefore considered "commercial harvest."

Table 5.–Commercial pink salmon catches (including hatchery cost recovery) and escapements in numbers of fish by subdistrict or section, Lower Cook Inlet, 2005.

Subdistrict/System	Catch	Escapement[a]	Total Run
SOUTHERN DISTRICT			
Humpy Creek		93,756	93,756
Halibut Cove (seine)	761		761
China Poot Bay			
Common Property (seine)	17,599		
Hatchery Cost Recovery	148		
China Poot Creek		9,223	
Total			26,970
Neptune Bay			
Common Property (seine)	8,783		
Hatchery Cost Recovery	88		
Total Catch			8,871
Tutka/Kasitsna Bays			
Common Property (seine)	4,779		
Hatchery Cost Recovery	1,631,806		
Tutka Lagoon Creek		133,600	
Total Run			1,770,185
Barabara Creek (set gillnet)	341	14,440	14,781
Seldovia Bay & River (seine)	279	98,602	98,881
Port Graham			
Hatchery Cost Recovery	510,802		
Port Graham River		69,095	
Duncan Slough		5,000[b]	
Hatchery Broodstock		84,088[c]	
Total			668,985
SOUTHERN DISTRICT TOTAL	**2,175,386**	**507,804**	**2,683,190**
OUTER DISTRICT			
Dogfish Bay		22,289	22,289
Port Chatham		44,389	44,389
Chugach Bay		6,911	6,911
Windy Bay	23,989		
Windy Right Creek		22,174	
Windy Left Creek		72,031	
Total			118,194
Rocky Bay	5,163		
Scurvy Creek		9,729	
Rocky River		198,671	
Total			213,563

-continued-

Table 5.–Page 2 of 2.

Subdistrict/System	Catch	Escapement[a]	Total Run
OUTER DISTRICT (cont'd)			
Port Dick			
South Section	81,043		
Port Dick (head end) Creek		122,236	
Slide Creek		33,206	
Middle Creek		10,100	
Island Creek		26,404	
Taylor Bay Creeks		36,677	
Total			309,666
Tonsina Bay		703	703
Nuka Island			
South Nuka Island Creek		11,199	
Berger Bay		5,551	
Mike's Bay		8,951	
Home Cove		6,023	
Herring Pete Bay		3,855	
Total			35,579
East Arm Nuka Bay (McCarty Fiord)			
Delight Lake		11,214	
Desire Lake		45,980	
Delusion Lake		3,746	
Total			60,940
OUTER DISTRICT TOTAL	**110,195**	**702,039**	**812,234**
EASTERN DISTRICT			
Aialik Bay	13,072	760	13,832
Resurrection Bay North	428[d]		
Bear/Salmon Creeks		34,452	
Sawmill Creek		363	
Spring Creek		2,856	
Tonsina Creek		9,922	
Humpy Cove		14,586	
Thumb Cove (Likes Creek)		8,668	
Total			71,275
EASTERN DISTRICT TOTAL	**13,500**	**71,607**	**85,107**
KAMISHAK BAY DISTRICT			
Inisksin Bay / North Head Creek	176	14,240	14,416
Cottonwood/Iliamna Bays	4,557		4,557
Ursus Cove / Brown's Peak Creek		60,983	60,983
Rocky Cove/Sunday Creek		116,170	116,170

-continued-

Table 5.–Page 3 of 3.

Subdistrict/System	Catch	Escapement[a]	Total Run
KAMISHAK BAY DISTRICT (con't)			
Kirschner Lake Section	1,974[e]		1,974
Bruin Bay/Bruin Bay River	1,019	98,346	99,365
Douglas River	35		35
KAMISHAK BAY DISTRICT TOTAL	**7,761**	**289,739**	**297,500**
TOTAL LOWER COOK INLET	**2,306,842**	**1,571,189**	**3,878,031**

Note: Figures for 2005 do not include a very small number of fish caught during commercial fishing periods but not sold (i.e. retained for personal use).

[a] Escapement estimates are derived from periodic ground or aerial surveys with stream life factors applied.

[b] Duncan Slough pink escapement estimated by Port Graham Hatchery personnel.

[c] Port Graham Hatchery pink salmon broodstock total includes 36,652 fish actually used for broodstock and 47,436 fish mortalities.

[d] Harvest authorized by ADF&G at Bear Creek weir, specifically for scientific testing by Alaska Department of Environmental Conservation.

[e] Incidental harvest during sockeye salmon hatchery cost recovery.

Table 6.–Commercial chum salmon catches and escapements in numbers of fish by subdistrict or section, Lower Cook Inlet, 2005.

Subdistrict/System	Catch	Escapement[a]	Total Run
SOUTHERN DISTRICT			
Humpy Creek		724	724
Halibut Cove			
Common Property (seine)	15		
Common Property (set gillnet)	67		
Total Catch			82
China Poot Bay (seine)	120		120
Neptune Bay (seine)	282		282
Tutka/Kasitsna Bays			
Common Property (seine)	5		
Common Property (set gillnet)	786		
Total Catch			791
Barabara Creek (set gillnet)	148		148
Seldovia Bay (set gillnet) & River	325	1,455	1,780
Port Graham/Port Graham River	2[b]	743	745
SOUTHERN DISTRICT TOTAL	**1,750**	**2,922**	**4,672**
OUTER DISTRICT			
Dogfish Bay		2,746	2,746
Port Chatham		544	544
Windy Bay	1,632		
Windy Right Creek		622	
Windy Left Creek		312	
Total			2,566
Rocky Bay & River	5,574	6,060	11,634
Port Dick			
South Section	5,318		
Port Dick (head end) Creek		4,848	
Slide Creek		3,493	
Middle Creek		1,137	
Island Creek		20,666	
Total			35,462
Nuka Island/Petrof River		8,440	8,440
OUTER DISTRICT TOTAL	**12,524**	**48,868**	**61,392**
EASTERN DISTRICT			
Aialik Bay	270		270
Resurrection Bay North (seine)	115		
Sawmill Creek		46	
Spring Creek		161	
Thumb Cove		54	
Tonsina Creek		1,500	
Total			1,876
EASTERN DISTRICT TOTAL	**385**	**1,761**	**2,146**

-continued-

Table 6.–Page 2 of 2.

Subdistrict/System	Catch	Escapement[a]	Total Run
KAMISHAK BAY DISTRICT			
Iniskin Bay	3,184		
Iniskin River		16,461	
Sugarloaf Creek		2,242	
North Head Creek		4,480	
Total			26,367
Cottonwood Bay & Creek	70,925	17,914	88,839
Ursus Cove			
Brown's Peak Creek		600	
Ursus Lagoon Right Creek		7,936	
Ursus Cove Lagoon Creek		4,240	
Total			12,776
Rocky Cove/Sunday Creek		500	500
Bruin Bay & River	6,992	21,208	28,200
McNeil River		17,411	17,411
Kamishak River/Reef			
Big Kamishak River		25,717	
Little Kamishak River		12,066	
Strike Creek		3,012	
Total			40,795
Douglas River/Silver Beach	2,842		
Douglas Beach Creek		1,455	
Total			4,297
KAMISHAK BAY DISTRICT TOTAL	**83,943**	**135,242**	**219,185**
TOTAL LOWER COOK INLET	**98,602**	**188,793**	**287,395**

Note: Figures for 2005 do not include a very small number of fish caught during commercial fishing periods but not sold (i.e. retained for personal use).

[a] Escapement estimates are derived from periodic ground or aerial surveys with stream life factors applied.

[b] Incidental harvest during pink salmon hatchery cost recovery.

Table 7.–Exvessel value of the commercial salmon catch in numbers of dollars by species, gear type, and harvest type, Lower Cook Inlet, 2005.

	Chinook	Sockeye	Coho	Pink	Chum	Total
COMMON PROPERTY–PURSE SEINE[a]						
No. of Fish	97	134,649	914	161,255	97,274	394,189
Pounds	1,159	561,656	6,353	539,784	835,072	1,944,024
Price/lb.	$0.83	$0.89	$0.27	$0.08	$0.23	
Value	$957	$497,448	$1,719	$44,261	$193,697	$738,082
COMMON PROPERTY–SET GILLNET[a]						
No. of Fish	525	15,669	1,905	341	1,326	19,766
Pounds	7,831	89,035	12,950	1,329	9,530	120,675
Price/lb.	$1.64	$1.30	$0.53	$0.10	$0.24	
Value	$12,861	$115,530	$6,897	$133	$2,297	$137,718
HATCHERY–PURSE SEINE & WEIR						
No. of Fish		82,360	1,519	2,145,246	2	2,229,127
Pounds		340,903	10,674	7,316,726	12	7,668,315
Price/lb.		$0.69[b]	$0.10[b]	$0.06	$0.10	
Value		$235,512[b]	$1[b]	$497,295	$1	$732,809
SPORT FISHING DERBY[c]**–HOOK & LINE**						
No. of Fish			4,788			4,788
Pounds			31,124			35,999
Price/lb.			$0.58			
Value			$18,052			$18,052
TOTAL ALL GEARS						
No. of Fish	622	232,678	9,126	2,306,842	98,602	2,647,870
Pounds	8,990	991,594	61,101	7,857,839	844,614	9,764,138
Price/lb.	$1.54	$0.86[b]	$0.53[b]	$0.07	$0.23	
Value	$13,818	$848,490[b]	$26,669[b]	$541,689	$195,995	$1,626,661

Note: Exvessel value is calculated from average prices, which are determined only by fish ticket information and may not reflect retroactive or postseason adjustments.

[a] 2005 seine and set gillnet totals do not include a very small number of fish not sold but retained for personal use.

[b] Average price per pound and value for hatchery cost recovery sockeye and coho salmon reflect only those fish actually sold and do not include hatchery fish that were donated.

[c] Fish entered into the Seward Silver Salmon Derby are subsequently sold to a commercial processor and are therefore considered "commercial harvest."

Table 8.–Emergency orders issued for the commercial, personal use, and subsistence salmon fisheries in Lower Cook Inlet, 2005.

E.O. Number/ Issue Date	DESCRIPTION
2-F-H-001-05 May 11	Opens those waters of Resurrection Bay in the Eastern District north of the latitude of Caines Head to commercial salmon seine fishing on a weekly schedule of 5 days per week, from Monday 6:00 a.m. until Friday 10:00 p.m., effective Monday, May 16, 2005, until further notice. Based on the provisions of this emergency order, all waters along the west shore of Resurrection Bay west of a line from the old military dock pilings north of Caines Head to a regulatory marker near the Seward Airport will remain closed to seining. In addition, this emergency order designates and establishes a Special Harvest Area (SHA) for Cook Inlet Aquaculture Association (CIAA) in Resurrection Bay North Subdistrict in the Eastern District of the Lower Cook Inlet (LCI) management area. The Bear Lake SHA includes those marine waters of Resurrection Bay in the Eastern District north of the latitude of Caines Head, as well as those fresh waters of Bear Creek, Salmon Creek, and Resurrection River downstream of, and including, the Bear Creek weir. This emergency order opens only the fresh waters of the Bear Lake SHA to the harvest and sale of salmon 7 days per week by authorized agents of CIAA, effective at 6:00 a.m. Monday, May 16, 2005, until further notice. Marine waters of the Bear Lake SHA remain closed to hatchery fishing until further notice.
2-F-H-002-05 May 27	Closes waters of Resurrection Bay in the Eastern District to commercial salmon seine fishing, effective at 10:00 p.m. Tuesday, May 31, 2005, until further notice. In addition, this emergency order opens marine waters of the Bear Lake Special Harvest Area (SHA; see ***Lower Cook Inlet Emergency Order #1-05***) to the harvest and sale of salmon by authorized agents of CIAA, effective at 6:00 a.m. Wednesday, June 1, 2005, until further notice.
2-F-H-003-05 May 27	Establishes a 7-days-per-week fishing schedule in the Kamishak Bay District commercial salmon seine fishery, which opens by regulation on June 1, 2005. Waters of Chenik Subdistrict within the Kamishak Bay District will remain closed to commercial salmon seining until further notice based on the provisions of this emergency order. This emergency order also closes the Port Graham Subdistrict, including both the Port Graham and English Bay Sections, in the Southern District to commercial salmon set gillnet fishing until further notice. In addition, this emergency order opens Halibut Cove, Tutka Bay, Barabara Creek, and Seldovia Bay Subdistricts in the Southern District to commercial salmon set gillnet fishing effective at 6:00 a.m. Thursday, June 2, 2005.
2-F-H-004-05 May 27	Closes all waters of Port Graham Subdistrict, including both the Port Graham and English Bay Sections, to subsistence salmon set gillnet fishing, effective at 11:59 p.m. Tuesday, May 31, 2005, until further notice.

-continued-

Table 8.–Page 2 of 7.

E.O. Number/ Issue Date	DESCRIPTION
2-F-H-005-05 June 4	Closes marine waters of the Bear Lake Special Harvest Area (SHA; see ***Lower Cook Inlet Emergency Order #1-05***) in Resurrection Bay of the Eastern District of Lower Cook Inlet to the harvest and sale of salmon by authorized agents of Cook Inlet Aquaculture Association (CIAA), effective at 10:00 p.m. Saturday, June 4, 2005. This emergency order subsequently opens waters of Resurrection Bay north of Caines Head to commercial salmon seine fishing for a 64-hour period, beginning at 6:00 a.m. Monday, June 6, 2005, until 10:00 p.m. Wednesday, June 8, 2005. Finally, this emergency order re-opens marine waters of the Bear Lake SHA to the harvest and sale of salmon by authorized agents of CIAA, effective at 6:00 a.m. Thursday, June 9, 2005, until further notice.
2-F-H-006-05 June 8	Rescinds the provisions of ***Lower Cook Inlet Emergency Order #5-05*** and cancels the previously announced hatchery seine opening for authorized agents of Cook Inlet Aquaculture Association (CIAA) in marine waters of the Bear Lake Special Harvest Area (SHA; see ***Lower Cook Inlet Emergency Order #1-05***) in Resurrection Bay of the Eastern District, scheduled to begin at 6:00 a.m. Thursday, June 9, 2005. This emergency order additionally extends the current commercial salmon seine opening in waters of Resurrection Bay north of Caines Head, originally scheduled to conclude effective at 10:00 p.m. Wednesday, June 8, 2005, until further notice.
2-F-H-007-05 June 16	Designates and establishes Special Harvest Areas (SHAs) for Cook Inlet Aquaculture Association (CIAA) in China Poot and Bruin Bay Subdistricts of the Lower Cook Inlet (LCI) management area. This emergency order closes the Kirschner Lake SHA to the common property salmon seine fishery, while concurrently opening waters of the Kirschner Lake SHA in the Kamishak Bay District, and the China Poot and Hazel Lake SHAs in the Southern District, to the harvest of salmon 7 days per week by authorized agents of CIAA, effective at 6:00 a.m. Monday, June 20, 2005, until further notice. This emergency order also opens portions of the China Poot, Tutka Bay, and Halibut Cove Subdistricts, all within the Southern District, to commercial salmon seining 5 days per week, from Monday 6:00 a.m. until Saturday 6:00 a.m., effective 6:00 a.m. Monday, June 20, 2005, until further notice. In the China Poot Subdistrict, commercial seining shall be allowed 5 days per week only in those waters outside (offshore) of a line beginning at a marker on the west shore of Neptune Bay at approximately 59° 32.84' N. latitude, 151° 24.90' W. longitude, then to Lancashire Rock, then to the navigational light on Gull Island, then to Moosehead Point, effective June 20. In the Halibut Cove Subdistrict, seining shall be allowed only in waters outside of Halibut Cove Lagoon beginning June 20 on a 5-days-per-week basis; waters within Halibut Cove Lagoon will remain closed to commercial fishing. In the Tutka Bay Subdistrict, commercial seining is restricted to those waters seaward of a line extending from the “rock quarry” on the north side of the bay at approximately 59° 30.23' N. latitude, 151° 28.23' W. longitude, to the Tutka Bay Lodge on the south side of the bay at approximately 59°28.45' N. latitude,

-continued-

Table 8.–Page 3 of 7.

E.O. Number/ Issue Date	DESCRIPTION
2-F-H-007-05 June 16 (continued)	151° 28.81' W. longitude, 5 days per week, effective 6:00 a.m. Monday, June 20, 2005. This emergency order also repeals the regulatory closed waters markers near the HEA power lines in China Poot Bay, and establishes temporary closed waters at the head of China Poot Bay to provide a Dungeness crab sanctuary.
2-F-H-008-05 June 23	Closes waters of McNeil River and Paint River Subdistricts in the Kamishak Bay District to commercial salmon seining effective at 6:00 a.m. Friday, June 24, 2005, until further notice.
2-F-H-009-05 June 24	Designates and establishes a Special Harvest Area (SHA) for the Cook Inlet Aquaculture Association (CIAA) in Tutka Bay Subdistrict within the Southern District of Lower Cook Inlet. The Tutka Bay SHA consists of all marine waters of Tutka Bay Subdistrict southeast of the Homer Electric Association powerline crossing, including waters of Tutka Lagoon. This emergency order also opens the Tutka Bay SHA to the harvest and sale of salmon 7 days per week by authorized agents of CIAA, effective at 6:00 a.m. Monday, June 27, 2005, until further notice. Revenue obtained from the sale of these fish will be used for recovery of operational expenses associated with the Tutka Lagoon Hatchery salmon enhancement programs in Lower Cook Inlet. The commercial purse seine fishery in the Tutka Bay Subdistrict is currently restricted to those waters seaward of a line extending from the "rock quarry" on the north side of Tutka Bay at approximately 59° 30.23' N. latitude, 151° 28.23' W. longitude, to the Tutka Bay Lodge on the south side of the bay at approximately 59° 28.45' N. latitude, 151° 28.81' W. longitude, on a 5-days-per-week basis (see ***LCI Emergency Order #2-F-H-007-05***). Waters of Tutka Bay between the HEA powerlines and the above-described line remain closed to all seine fishing. In addition, this emergency order designates and establishes a SHA for the Port Graham Hatchery Corporation (PGHC) in the Port Graham Subdistrict within the Southern District of Lower Cook Inlet. The Port Graham SHA consists of all marine waters of the Port Graham Subdistrict east of 151° 53.08' W. longitude, and south and west of a line from the southernmost tip of Passage Island to the Coast Guard navigational buoy at approximately 59° 21.45' N. latitude, 151° 50.05' W. longitude, then southeast to a point on the mainland at approximately 59° 20.83' N. latitude, 151° 48.53' W. longitude. This area is located along the south shore of Port Graham from Passage Island to (and including) Duncan Slough. No fishing periods for the Port Graham SHA are being established at this time.

-continued-

Table 8.–Page 4 of 7.

E.O. Number/ Issue Date	DESCRIPTION
2-F-H-010-05 June 27	Opens waters of Chenik Subdistrict in the Kamishak Bay District south of 59° 16′ N. latitude to commercial salmon seining 5 days per week, from 6:00 a.m. Monday until 6:00 a.m. Saturday, effective at 6:00 a.m. Wednesday, June 29, 2005, until further notice. Waters north of 59° 16′ N. latitude in Chenik Subdistrict will remain closed to fishing. Regulatory markers near the mouth of Chenik Creek remain in effect for this opening, and fishing is therefore prohibited in waters of Chenik Lagoon.
2-F-H-011-05 June 28	Reopens all waters of Port Graham Subdistrict, including both the Port Graham and English Bay Sections, to subsistence salmon set gillnet fishing, effective at 10:00 p.m. Thursday, June 30, 2005, until further notice.
2-F-H-012-05 July 1	Extends fishing time for commercial set gillnet fishing in Halibut Cove Subdistrict of the Southern District to 5 days per week, from 6:00 a.m. Monday until 6:00 a.m. Saturday, effective at 6:00 a.m. Tuesday, July 5, 2005, until further notice. In addition, this emergency order restricts commercial salmon seining in Tutka Bay Subdistrict within the Southern District to those waters seaward (northwest) of a line beginning at the "rock quarry" on the north side of the bay at approximately 59° 30.23' N. latitude, 151° 28.23' W. longitude, to a point on the west shore of the entrance to Little Tutka Bay at approximately 59° 28.63' N. latitude, 151° 30.37' W. longitude, effective at 6:00 a.m. Tuesday, July 5, 2005, until further notice. The weekly fishing period for purse seining in waters of Tutka Bay Subdistrict, already established at 5 days per week (see ***LCI Emergency Order #2-F-H-007-05***), remains unchanged.
2-F-H-013-05 July 5	Closes waters of Chenik Subdistrict in the Kamishak Bay District to commercial salmon seining effective at 6:00 a.m. Wednesday, July 6, 2005, until further notice.
2-F-H-014-05 July 5	Closes waters of Resurrection Bay in the Eastern District of Lower Cook Inlet to commercial salmon seining effective at 10:00 p.m. Friday, July 8, 2005, until further notice. In addition, this emergency order opens waters of Aialik Subdistrict, including Aialik Lagoon, also in the Eastern District, to commercial salmon seining 5 days per week, from Monday 6:00 a.m. until Saturday 6:00 a.m., effective at 6:00 a.m. Monday, July 11, 2005, until further notice.
2-F-H-015-05 July 11	Reopens waters of Chenik Subdistrict in the Kamishak Bay District south of 59° 16′ N. latitude to commercial salmon seining 5 days per week, from 6:00 a.m. Monday until 6:00 a.m. Saturday, effective at 6:00 a.m. Wednesday, July 13, 2005, until further notice. Waters north of 59° 16′ N. latitude in Chenik Subdistrict will remain

-continued-

Table 8.–Page 5 of 7.

E.O. Number/ Issue Date	DESCRIPTION
2-F-H-015-05 July 11 (continued)	closed to fishing. Regulatory markers near the mouth of Chenik Creek remain in effect for this opening, and fishing is therefore prohibited in waters of Chenik Lagoon.
2-F-H-016-05 July 15	Closes waters of the China Poot and Hazel Lakes Special Harvest Areas (see LCI E.O. #2-F-H-007-05) in the Southern District to salmon hatchery cost recovery harvest by Cook Inlet Aquaculture Association effective immediately. In addition, this emergency order opens waters of China Poot Subdistrict, including both the China Poot and Hazel Lake Sections, to commercial salmon seining west (or offshore) of the regulatory markers located near the HEA power lines in China Poot Bay on a 7-days-per-week basis, effective at 6:00 a.m. Saturday, July 16, 2005, until further notice. Waters of China Poot Bay east (or inshore) of these markers will be open to commercial seining 5 days per week, from Monday 6:00 a.m. until Saturday 6:00 a.m., also effective at 6:00 a.m. Saturday, July 16, 2005, until further notice. The regulatory markers designating the Dungeness crab sanctuary in the north arm of China Poot Bay remain in effect for these openings. At China Poot Creek, the regulatory markers near the creek mouth will be in effect during the Monday through Saturday opening. At Neptune Bay, no markers will be in effect and fishing is allowed up to the Wosnesenski River mouth. In addition, this emergency order closes waters of Chenik Subdistrict in the Kamishak Bay District to commercial salmon seining effective at 6:00 a.m. Saturday, July 16, 2005, until further notice. Finally, this emergency order opens waters of the Windy Bay and Rocky Bay Subdistricts, and the South, Outer, and Taylor Bay Sections of Port Dick Subdistrict, or statistical reporting areas 232-06, 232-07, and 232-08, all in the Outer District, to commercial salmon seining on a schedule of 5 days per week, from 6:00 a.m. Monday until 10:00 p.m. Friday, effective at 6:00 a.m. Monday, July 18, 2005, until further notice. All normal regulatory markers and closed waters in all subdistricts, including those in Taylor Bay, Tacoma Cove, and Sunday Harbor, will be in effect for this opening. Additionally, waters of the North Section of Port Dick Subdistrict, or statistical reporting area 232-09, will remain closed to fishing.
2-F-H-017-05 July 20	Reopens waters of Chenik Subdistrict in the Kamishak Bay District south of 59° 16′ N. latitude to commercial salmon seining 7 days per week, effective at 12:00 noon Thursday, July 21, 2005, until further notice. In addition, provisions of this emergency order rescind regulatory markers near the mouth of Chenik Lake Creek, and fishing is therefore allowed in waters of Chenik Lagoon beginning July 21. Waters north of 59° 16′ N. latitude in Chenik Subdistrict will remain closed to fishing.

-continued-

Table 8.–Page 6 of 7.

E.O. Number/ Issue Date	DESCRIPTION
2-F-H-018-05 July 22 (continued)	Extends the weekly fishing period for commercial salmon seining in waters of Windy Bay and Rocky Bay Subdistricts, and the South, Outer, and Taylor Bay Sections of Port Dick Subdistrict, or statistical reporting areas 232-06, 232-07, and 232-08, all in the Outer District, to 7 days per week, effective at 10:00 p.m. Friday, July 22, 2005, until further notice. All normal regulatory markers and closed waters in all subdistricts, including those in Taylor Bay, Tacoma Cove, and Sunday Harbor, remain in effect for this opening. Additionally, waters of the North Section of Port Dick Subdistrict, or statistical reporting area 232-09, will remain closed to fishing.
2-F-H-019-05 July 28	Opens those waters of the Port Graham Special Harvest Area (***see LCI Emergency Order #2-F-H-009-05***) east of the longitude of the U.S. Coast Guard navigational buoy at approximately 151° 50.05' W. longitude to the harvest of salmon 7 days per week by authorized agents of Port Graham Hatchery Corporation (PGHC), effective at 6:00 a.m. Friday, July 29, 2005, until further notice. Pink salmon harvested during this opening may be utilized for both hatchery brood stock and hatchery cost recovery.
2-F-H-020-05 July 29	Opens commercial salmon seining in waters of Port Chatham Subdistrict in the Outer District 7 days per week, effective at 6:00 a.m. Saturday, July 30, 2005, until further notice. All normal regulatory markers and closed waters in Port Chatham Subdistrict remain in effect for this opening.
2-F-H-021-05 August 3	Opens waters of Humpy Creek and Seldovia Bay Subdistricts in the Southern District to commercial salmon seining 5 days per week, from 6:00 a.m. Monday until 6:00 a.m. Saturday, effective at 6:00 a.m. Thursday, August 4, 2005, until further notice. All normal regulatory markers and closed waters in both subdistricts remain in effect for this opening. In addition, this emergency order extends the weekly fishing period for commercial set gillnetting in waters of Seldovia Bay Subdistrict to 5 days per week, from 6:00 a.m. Monday until 6:00 a.m. Saturday, also effective at 6:00 a.m. Thursday, August 4, 2005, until further notice.
2-F-H-022-05 August 5	Opens waters of Tutka Bay Subdistrict in the Southern District northwest (offshore) of the Homer Electric Association (HEA) overhead powerline crossing to commercial salmon seining effective at 6:00 a.m. Monday, August 8, 2005, until further notice. The weekly fishing period in Tutka Bay Subdistrict remains unchanged at 5 days per week, from 6:00 a.m. Monday until 6:00 a.m. Saturday, as set forth in ***LCI Emergency Order #2-F-H-007-05***.

-continued-

Table 8.–Page 7 of 7.

E.O. Number/ Issue Date	DESCRIPTION
2-F-H-023-05 August 9	Opens all waters of the Port Graham Special Harvest Area (see ***LCI Emergency Order #2-F-H-009-05***) to the harvest of salmon 7 days per week by authorized agents of Port Graham Hatchery Corporation (PGHC), effective at 6:00 a.m. Wednesday, August 10, 2005, until further notice. Pink salmon harvested during this opening may be utilized for both hatchery broodstock and hatchery cost recovery.
2-F-H-024-05 August 12	Delays the opening of the 2005 Southern District (Kachemak Bay) personal use set gillnet fishery for coho salmon until 6:00 a.m. Tuesday, August 16, 2005.
2-F-H-025-05 August 12	Repeals the commercial fishing regulatory markers at the entrance to Ursus Lagoon in Ursus Cove Subdistrict of the Kamishak Bay District, effective at 6:00 a.m. Monday, August 15, 2005, until further notice. Based on the provisions of this emergency order, commercial salmon seining will be allowed inside waters of Ursus Lagoon beginning at 6:00 a.m. Monday, August 15. The weekly fishing schedule for waters affected by this emergency order remains the same as that in all other waters open to fishing in Kamishak Bay District at 7 days per week.
2-F-H-026-05 August 26	Closes the Southern District (Kachemak Bay) personal use set gillnet fishery for coho salmon, effective at 6:00 a.m. Wednesday, August 31, for the remainder of the 2005 season.

Table 9.–Total return of adult pink salmon to the Tutka Bay Hatchery in the Southern District of Lower Cook Inlet, 2005**.**

COMMERCIAL HARVEST	
Tutka Bay/Lagoon (stat area 241-16)	
Purse Seine	4,779
Set Gillnet	0
Hatchery Cost Recovery	1,631,806
Tutka Commercial Harvest	*1,636,585*
SPORT HARVEST	
Total Sport Harvest (Tutka Bay and Lagoon)	*1,500*[a]
ESCAPEMENT	
Tutka Creek and Channel	133,600
Tutka Hatchery Broodstock	0[b]
Total Escapement	*133,600*
Total Return	***1,771,685***

[a] Figure represents estimated average sport catch of pink salmon in Tutka Bay from 1990-1999.

[b] Because CIAA announced the indefinite suspension of operations at Tutka Hatchery, no broodstock was collected in 2005.

Table 10.–Commercial salmon catch (in numbers and pounds of fish) and effort (in number of permits fished and number of landings) by district, Lower Cook Inlet, 2005.

DISTRICT	Number Permits Fished	Landings	Chinook		Sockeye		Coho		Pink		Chum	
			Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
Eastern (231)	17	241	0	0	56,951	236,632	6,309	41,812	13,500	47,079	385	3,132
Outer (232)	5	20	0	0	1	4	3	20	110,195	492,776	12,524	88,081
Southern (241)	43	610	621	8,982	110,739	492,776	2,722	18,566	2,175,386	7,413,955	1,750	12,275
Kamishak Bay (249)	9	39	1	8	64,987	262,182	92	703	7,761	24,764	83,943	741,126
LCI Grand Total	**50**	**910**	**621**	**8,990**	**232,678**	**991,594**	**9,126**	**61,101**	**2,306,842**	**7,857,839**	**98,602**	**844,614**
Avg. Wt.				14.47		4.26		6.70		3.41		8.57
Avg. Price				$1.54		$0.86[a]		$0.53[a]		$0.07		$0.23

Note: Figures for 2005 do not include a very small number of fish caught during commercial fishing periods but not sold (i.e. retained for personal use).

[a] Average price per pound reflects only those fish actually sold and does not include hatchery fish that were donated.

Table 11.–Total biomass estimates and commercial catch of Pacific herring *Clupea pallasi* in short tons by age class, Kamishak Bay District, Lower Cook Inlet, 2005, and 2006 forecast.

Age	2005 Est. Spawning Biomass	Percent by Weight	2005 Commercial Harvest[a]	Percent by Weight	2005 Total Biomass	Percent by Weight	2006 Forecast Biomass	Percent by Weight
1								
2								
3	192	8.2	--	--	192	8.2	790	29.8
4	549	23.4	--	--	549	23.4	219	8.3
5	199	8.5	--	--	199	8.5	545	20.6
6	468	20.0	--	--	468	20.0	173	6.5
7	83	3.6	--	--	83	3.6	365	13.8
8	219	9.3	--	--	219	9.3	63	2.4
9	308	13.1	--	--	308	13.1	165	6.2
10	66	2.8	--	--	66	2.8	158	6.0
11	126	5.3	--	--	126	5.3	51	1.9
12	99	4.2	--	--	99	4.2	52	2.0
13+	37	1.6	--	--	37	1.6	68	2.6
TOTALS	**2,346**	**100.0**	**--**	**--**	**2,346**	**100.0**	**2,650**	**100.1**

[a] Due to the low forecasted biomass, the commercial herring fishery in Kamishak Bay was not opened in 2005.

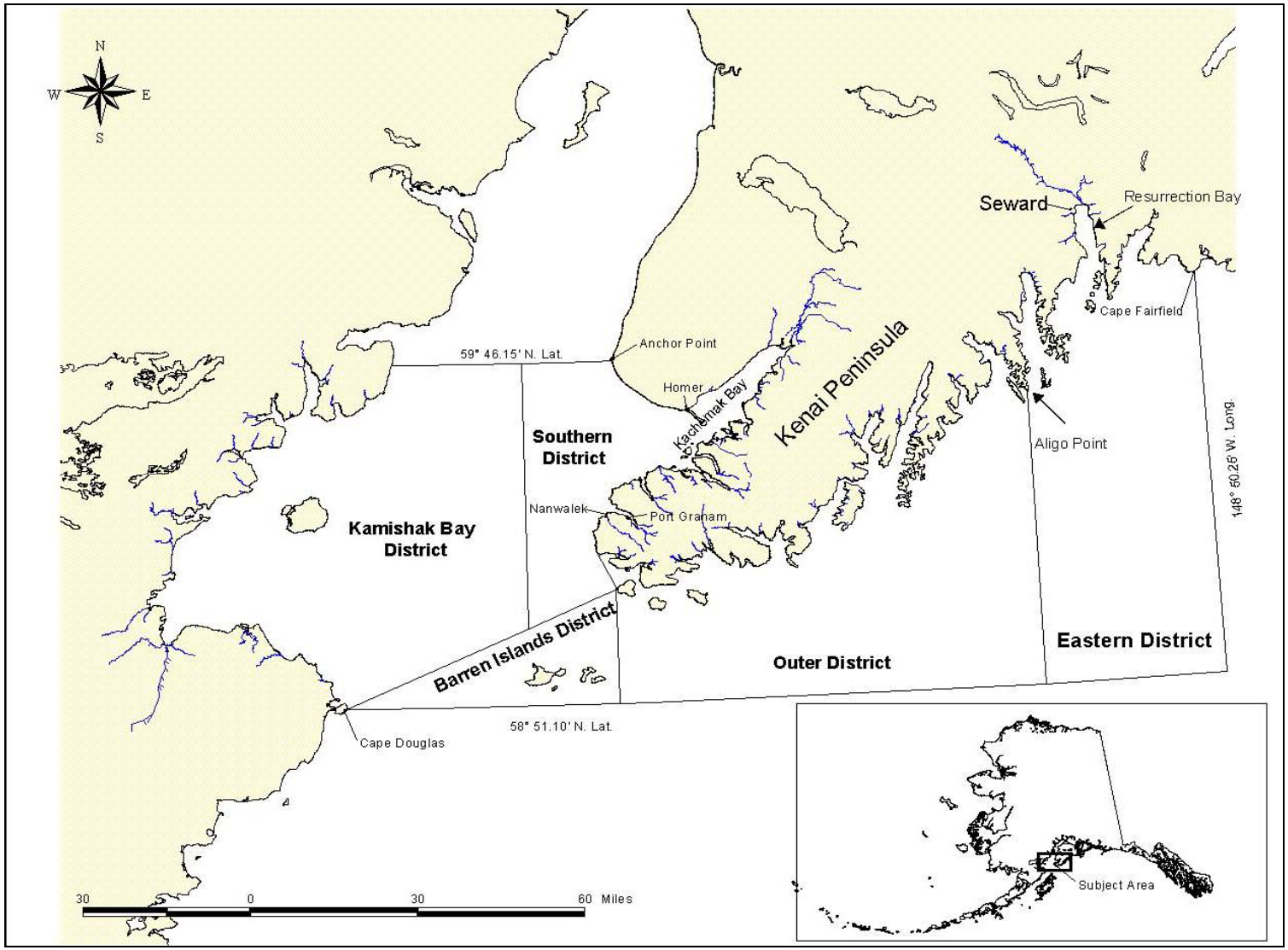

Figure 1.–Lower Cook Inlet salmon and herring management area.

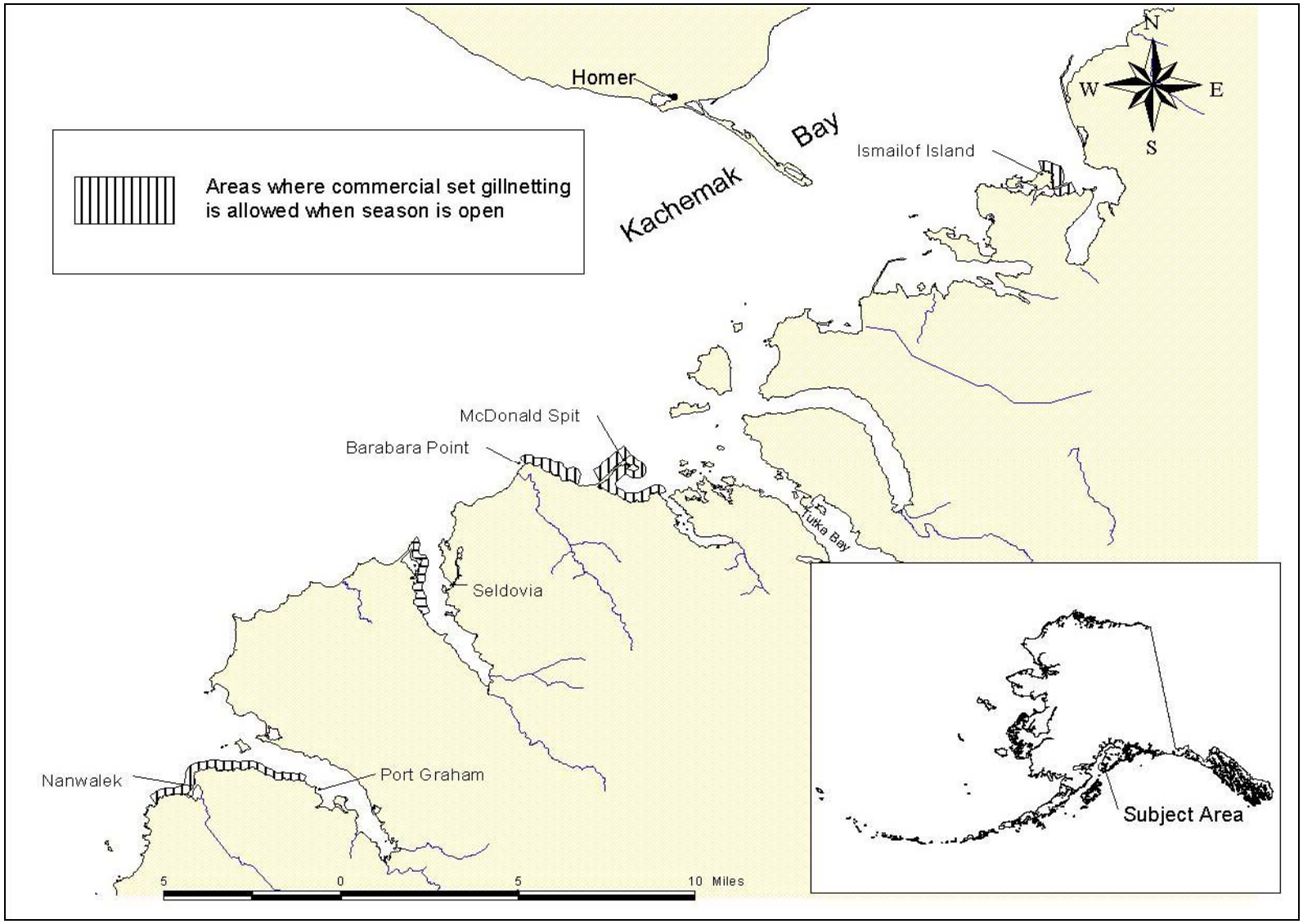

Figure 2.–Commercial set gillnet locations in the Southern District of Lower Cook Inlet.

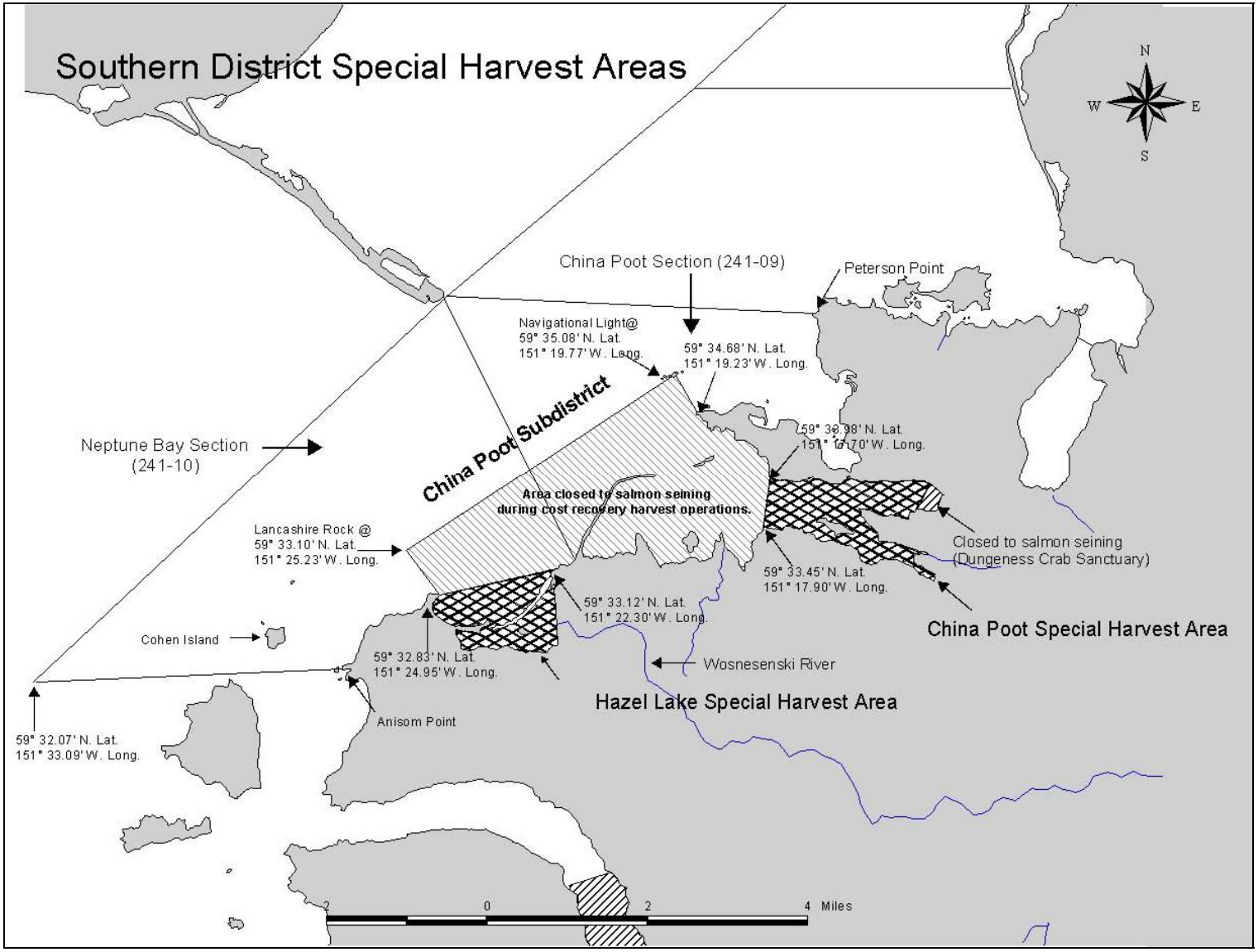

Figure 3.–China Poot and Hazel Lake Special Harvest Areas for salmon hatchery cost recovery in the Southern District of Lower Cook Inlet.

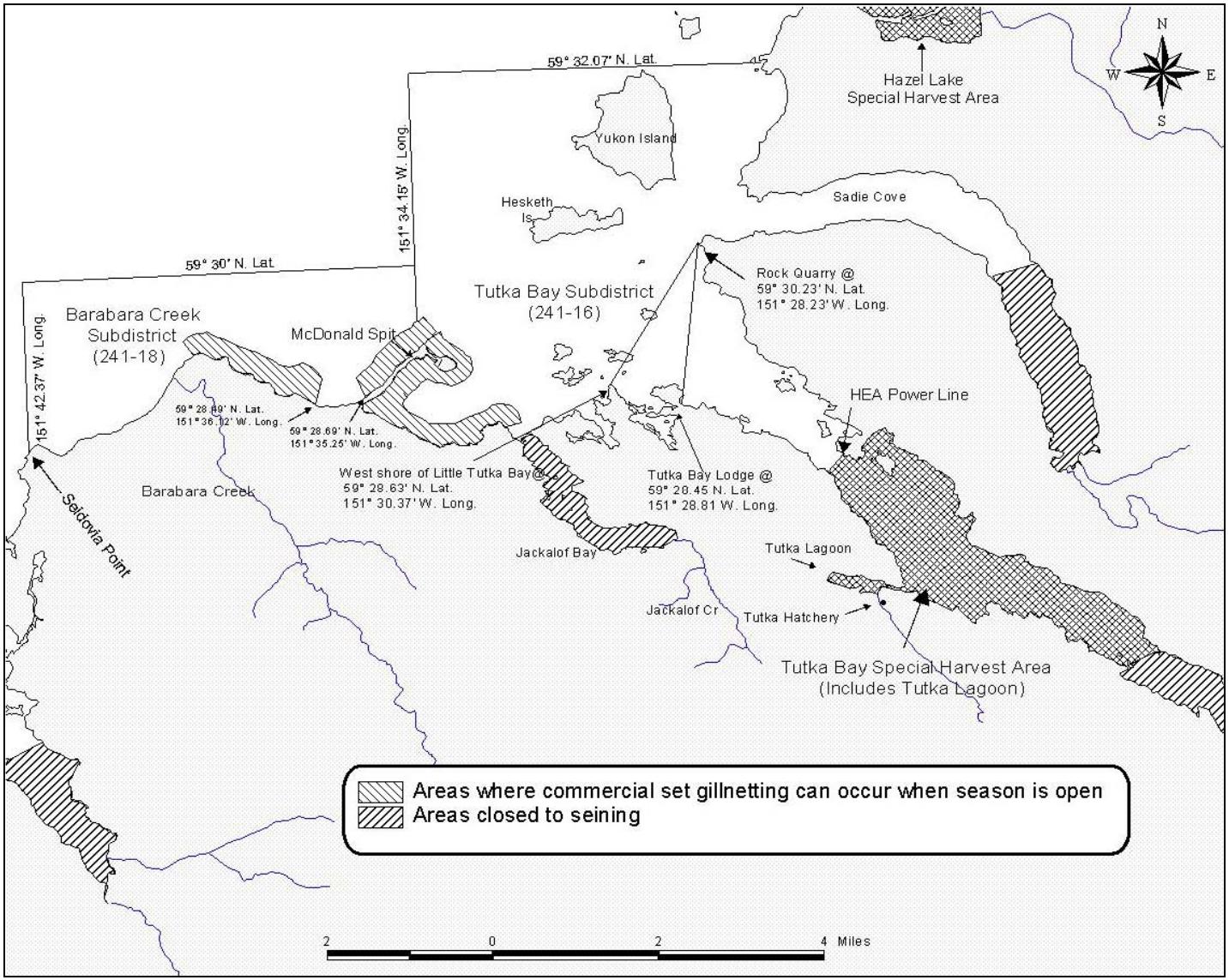

Figure 4.–Tutka Bay Special Harvest Area for salmon hatchery cost recovery in the Southern District of Lower Cook Inlet.

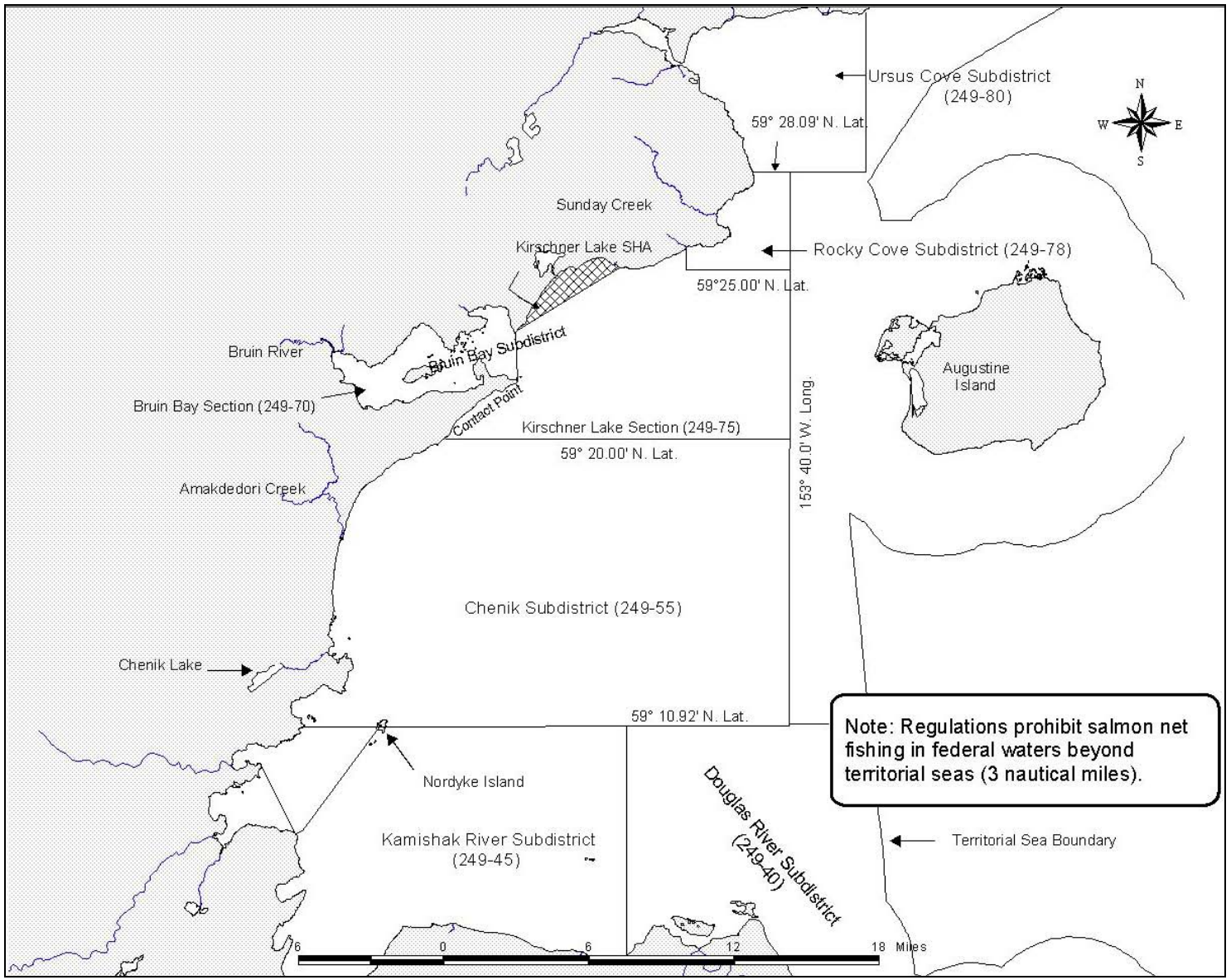

Figure 5.–Kirschner Lake Special Harvest Area for salmon hatchery cost recovery in Kamishak Bay District of Lower Cook Inlet.

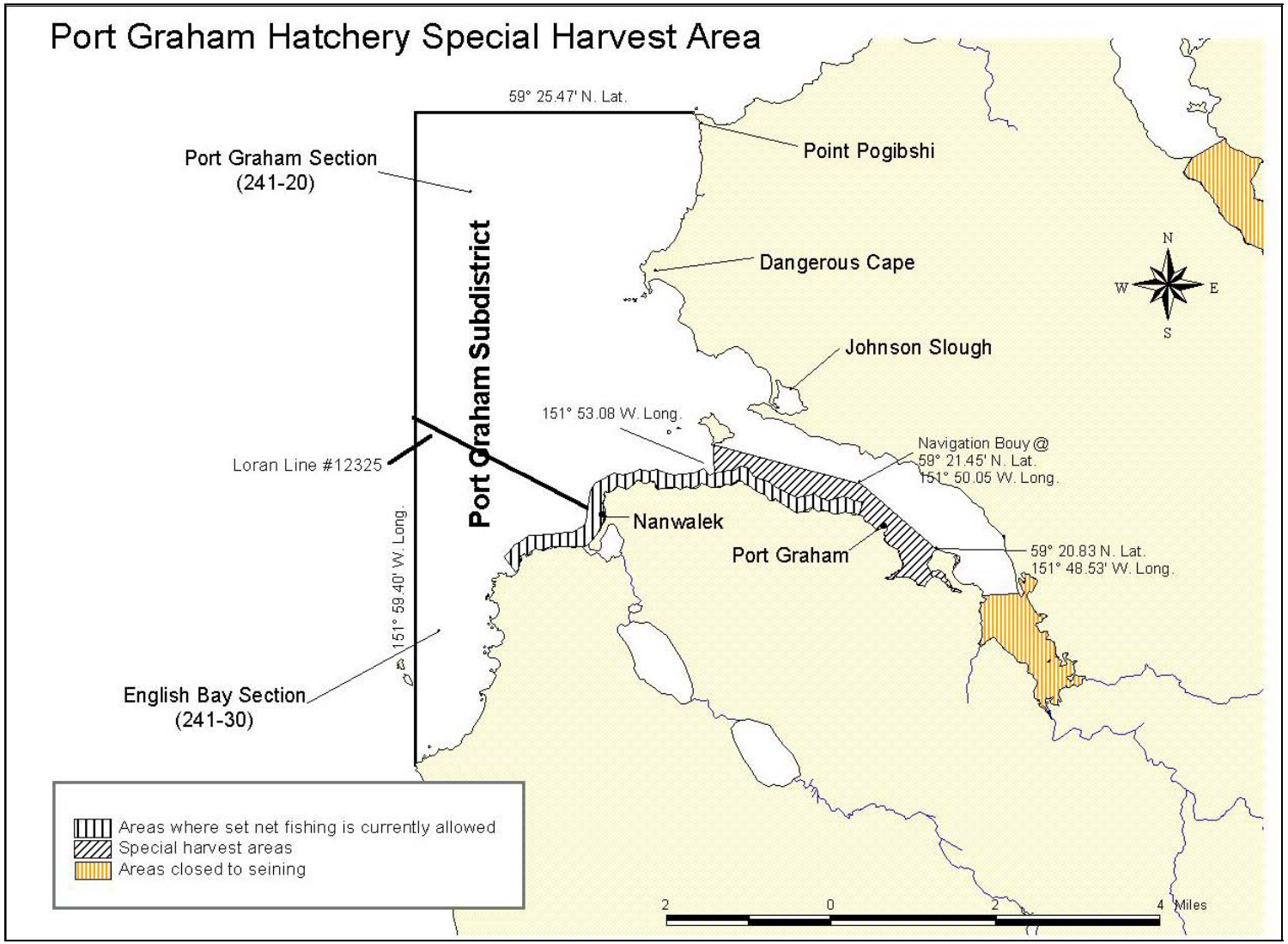

Figure 6.–Port Graham Special Harvest Area for salmon hatchery cost recovery in the Southern District of Lower Cook Inlet**.**

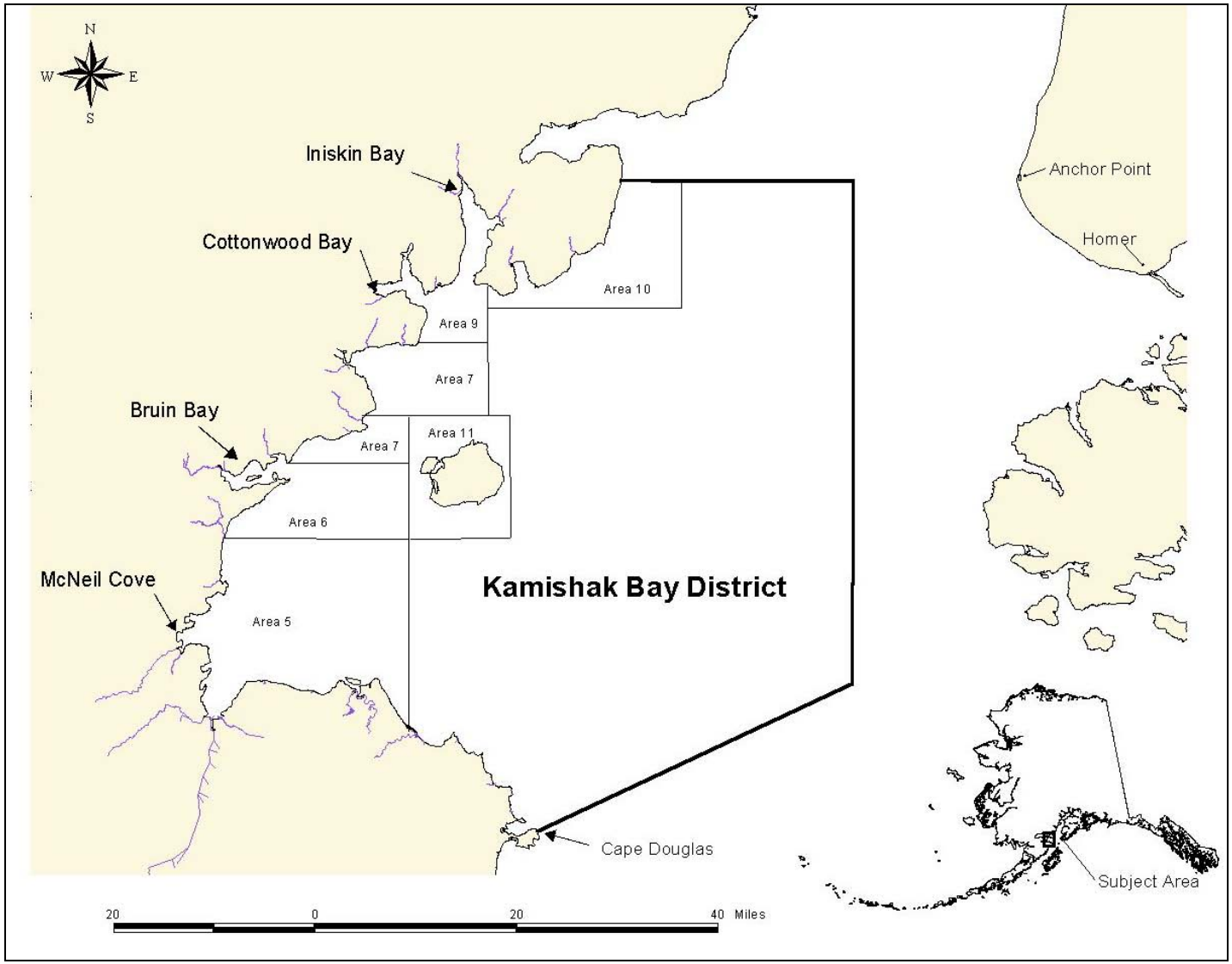

Figure 7.–Commercial herring fishing areas for management purposes in Kamishak Bay District of Lower Cook Inlet.

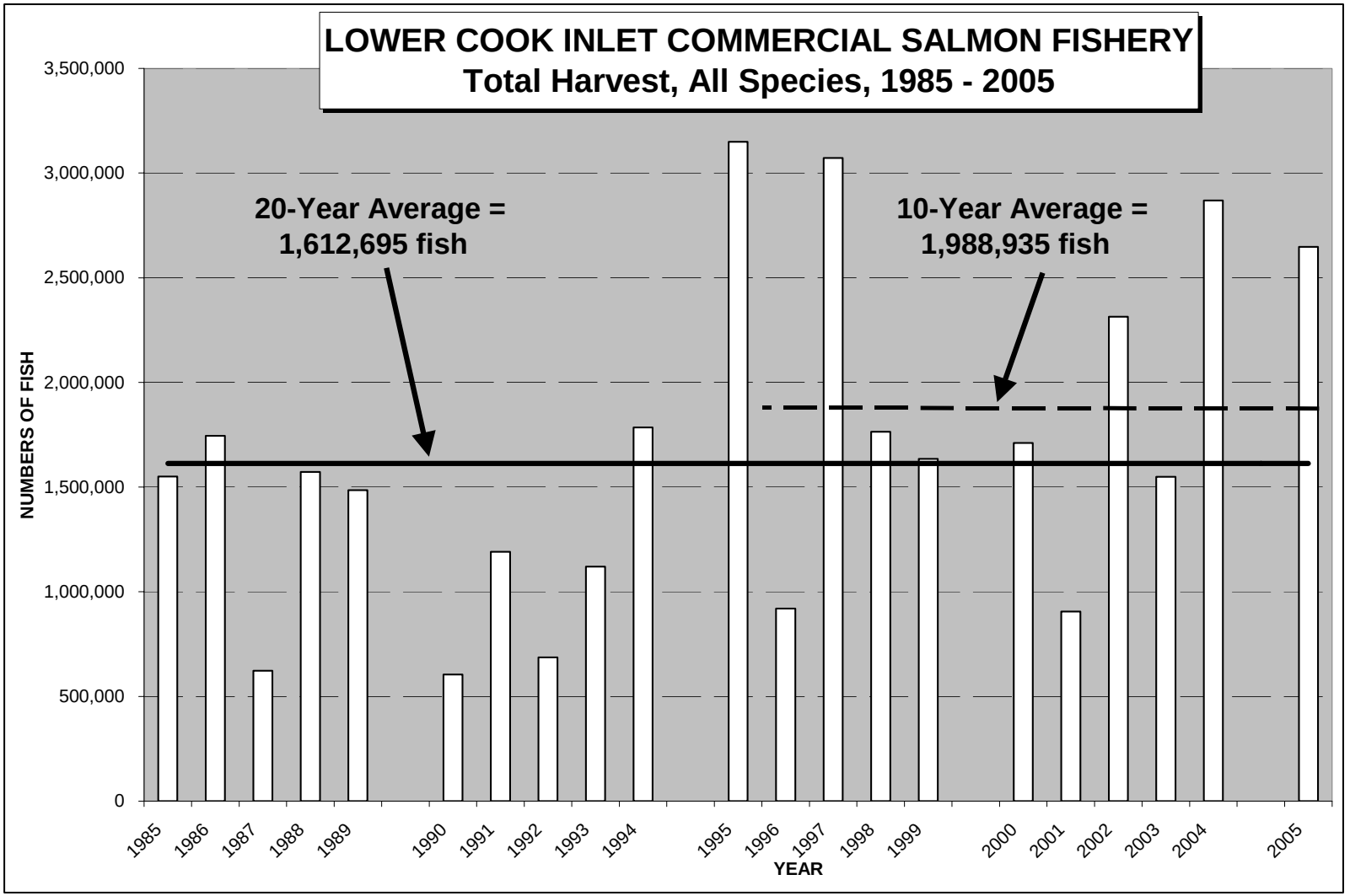

Figure 8.–Total commercial salmon catch, Lower Cook Inlet, 1985–2005.

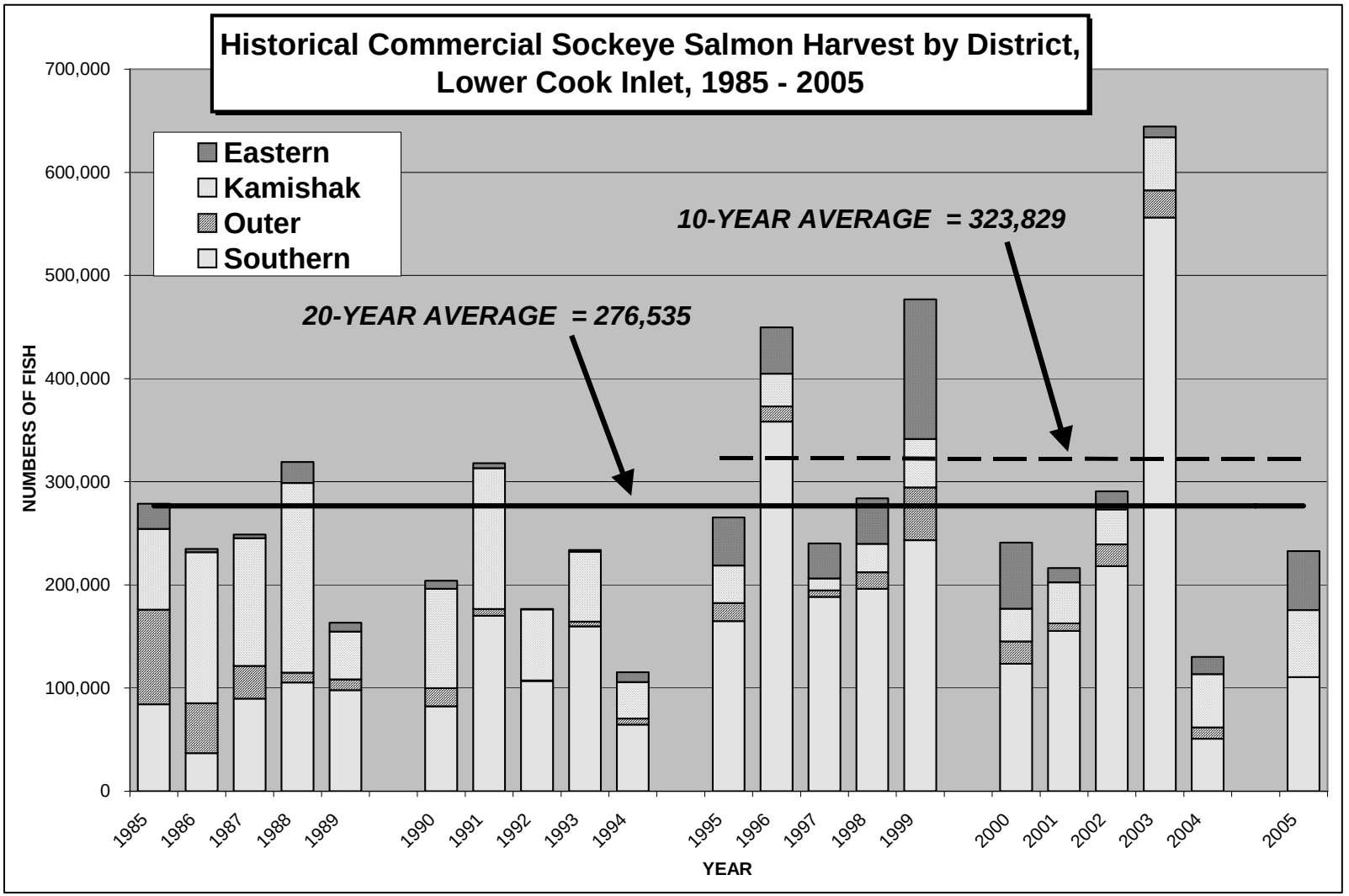

Figure 9.–Commercial sockeye salmon catch by district, Lower Cook Inlet, 1985–2005**.**

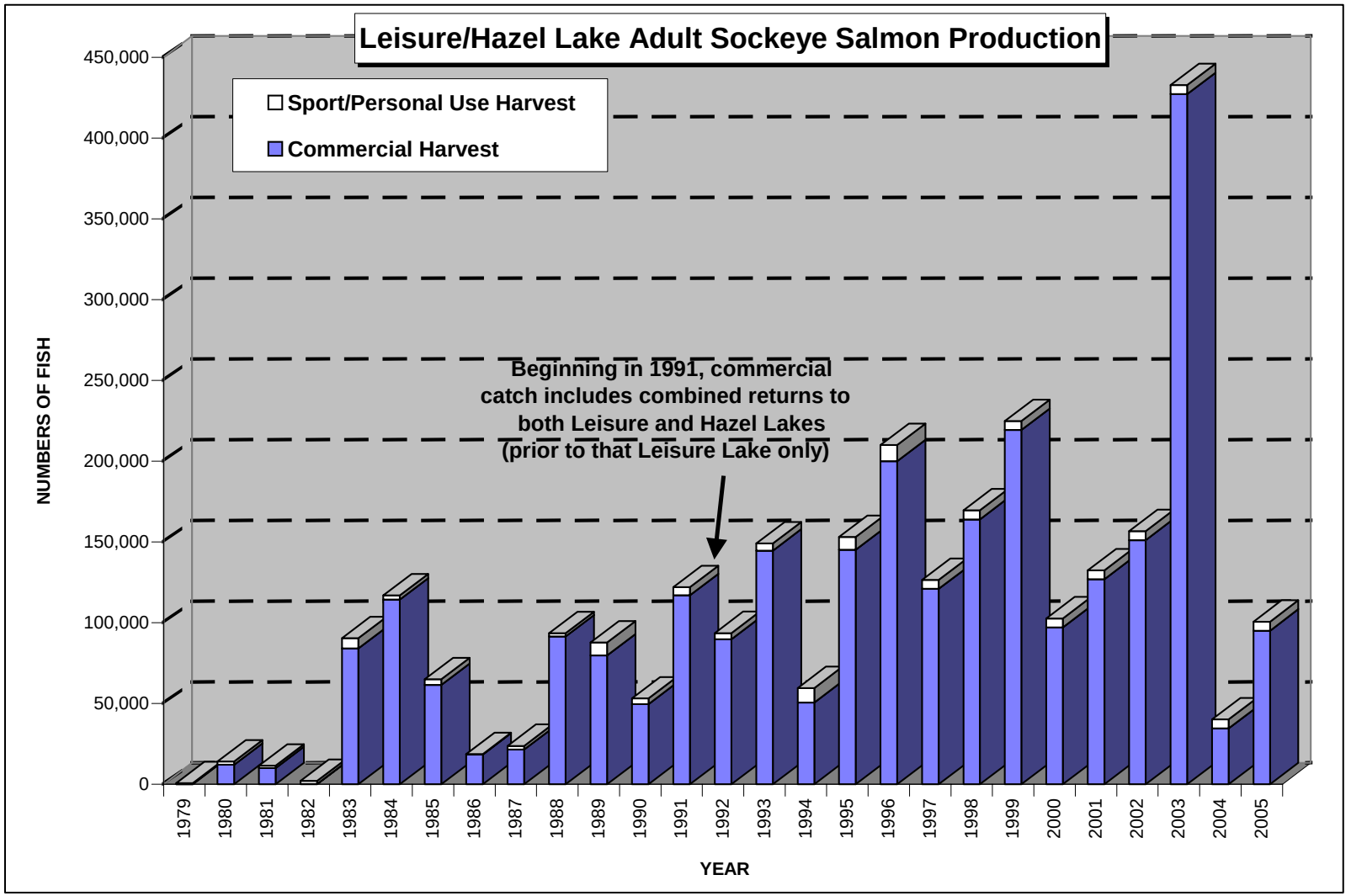

Figure 10.–Sockeye salmon returns to Leisure and Hazel Lakes in the Southern District of Lower Cook Inlet, 1979–2005**.**

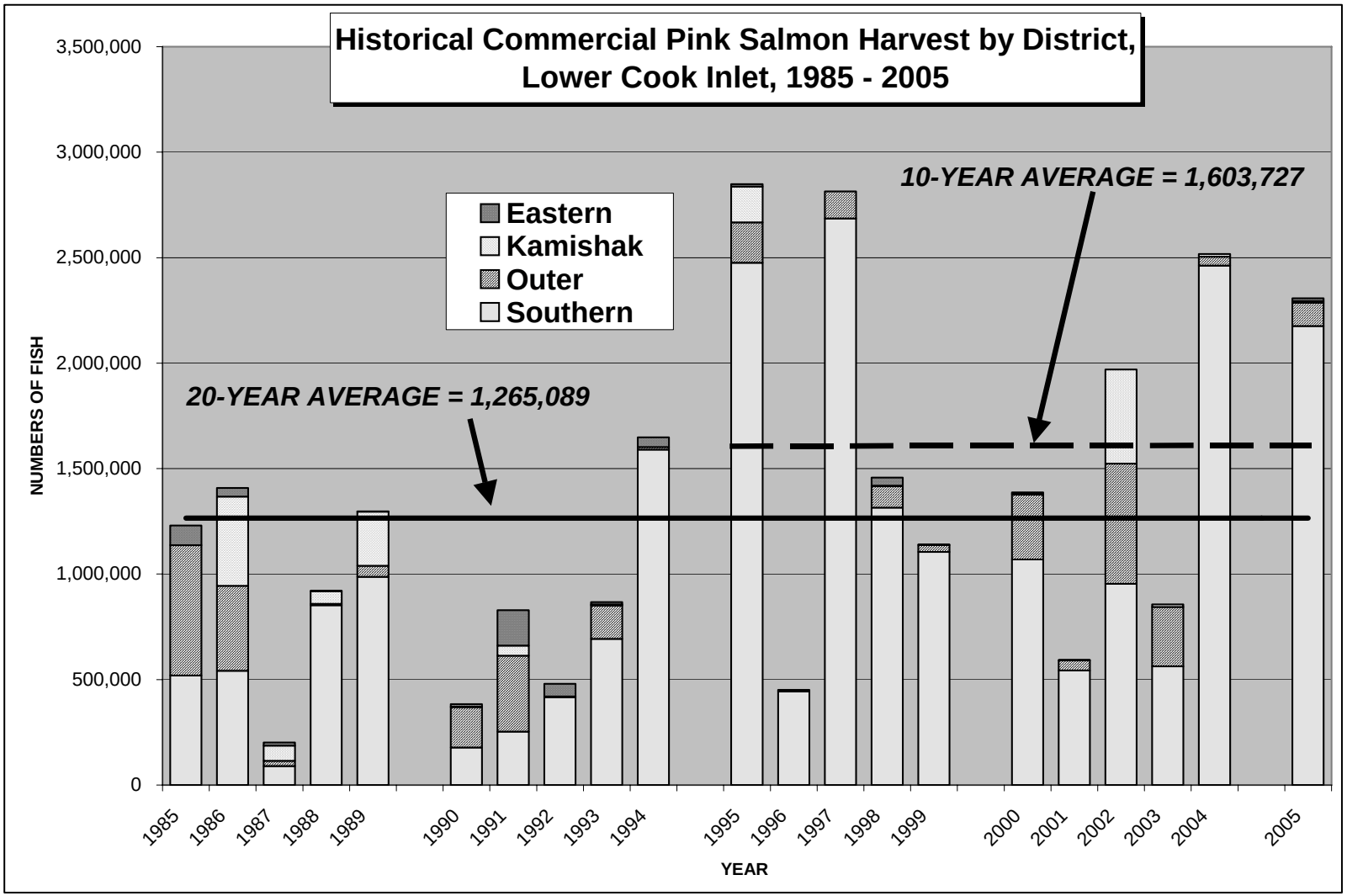

Figure 11.–Commercial pink salmon catch by district, Lower Cook Inlet, 1985–2005.

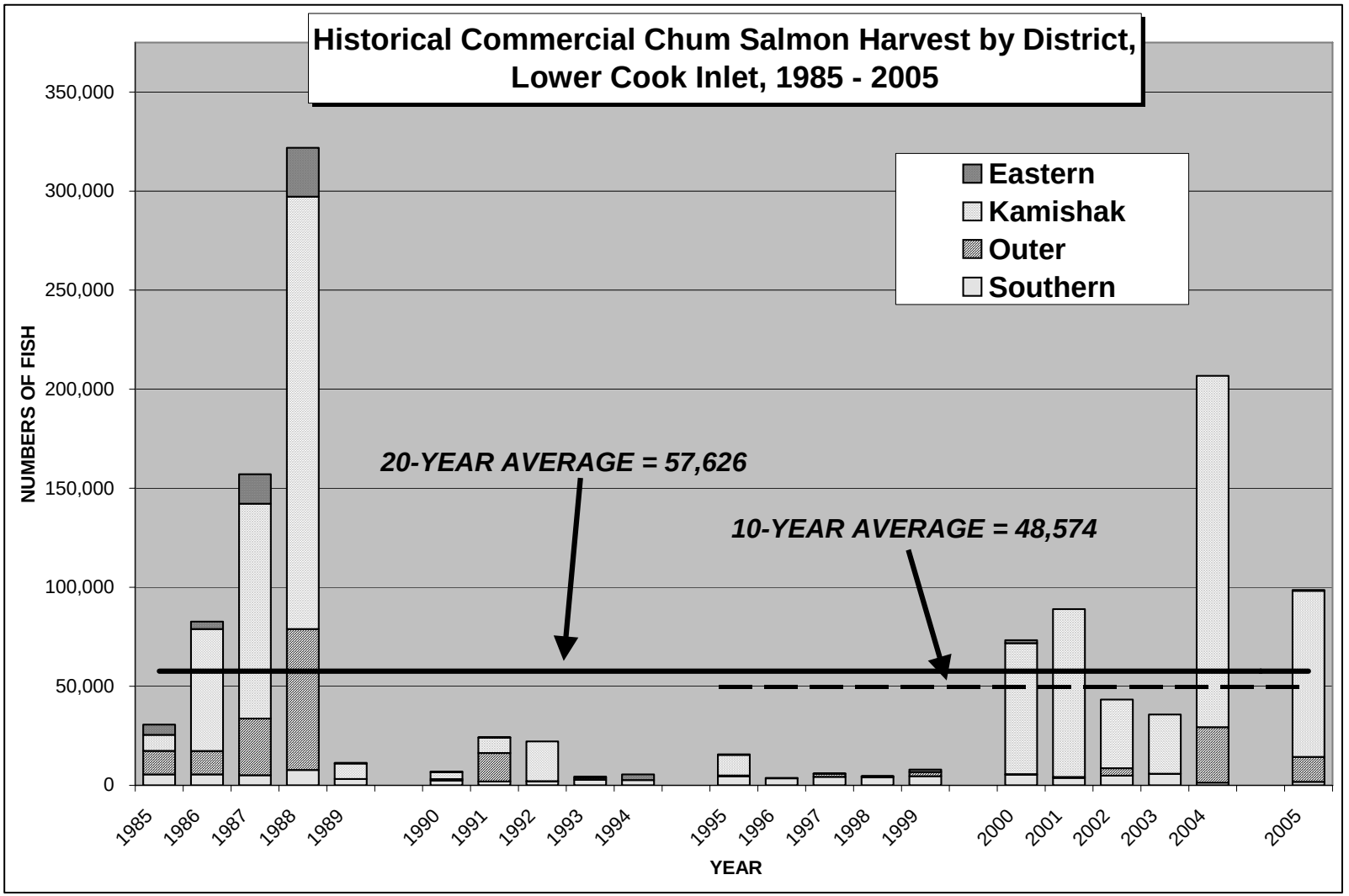

Figure 12.–Commercial chum salmon catch by district, Lower Cook Inlet, 1985–2005.

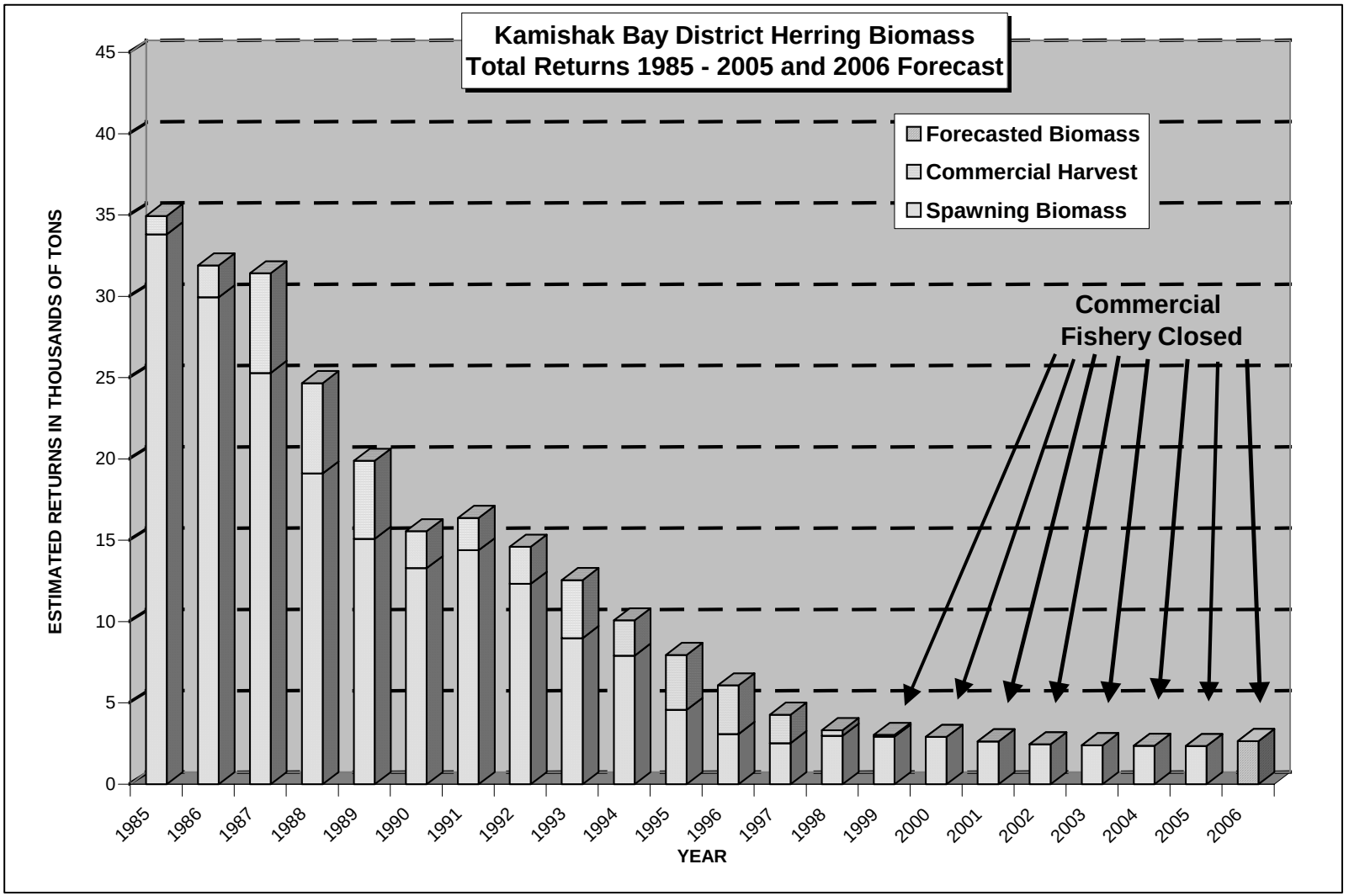

Figure 13.–Biomass estimates and commercial harvests of Pacific herring *Clupea pallasi* in the sac roe seine fishery, Kamishak Bay District, Lower Cook Inlet, 1985–2005, and 2006 projection.

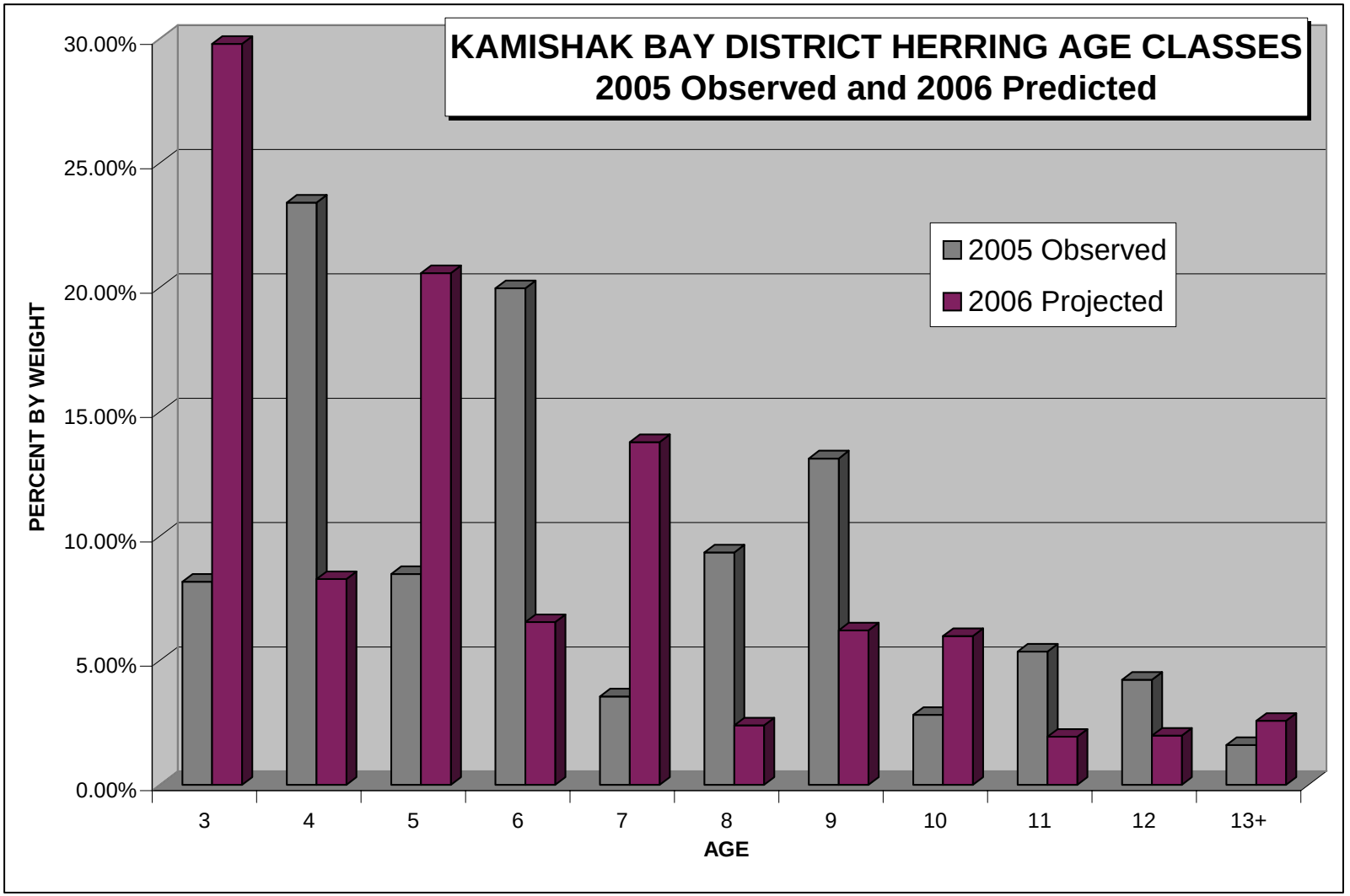

Figure 14.–Herring age composition from samples collected in Kamishak Bay District, Lower Cook Inlet, 2005, and 2006 forecast.

APPENDIX A. HISTORICAL SALMON TABLES

Appendix A1.–Salmon fishing permits issued and fished, by gear type, Lower Cook Inlet, 1985–2005.

Year	Seines				Set Net Permits Fished
	Permanent Permits	Interim Permits	Total Issued	Actively fished	
1985	80	1	81	51	34
1986	79	0	79	62	34
1987	79	0	79	66	29
1988	79	0	79	71	27
1989	83	0	83	64	23
1990	82	1	83	71	20
1991	82	1	83	68	20
1992	82	1	83	63	21
1993	82	1	83	51	17
1994	82	1	83	32	16
1995	83	1	84	49	23
1996	84	1	85	34	24
1997	84	1	85	23	25
1998	84	2	85	41	24
1999	84	2	86	45	20
2000	84	2	86	36	24
2001	84	2	86	25	18
2002	84	2	86	25	24
2003	84	2	86	27	24
2004	84	2	86	24	19
2005	84	2	86	29	17
1985-2004 Avg.	82	1	84	46	23
1995-2004 Avg.	84	2	86	33	23

Source: Commercial Fisheries Entry Commission *Unpublished;* ADF&G fish ticket database *Unpublished.*

Appendix A2.–Exvessel value of the commercial salmon harvest in thousands of dollars by species, Lower Cook Inlet, 1985–2005.

Year	Chinook	Sockeye	Coho	Pink	Chum	Total
1985	47	1,637	86	974	78	2,822
1986	21	1,414	132	1,245	201	3,013
1987	27	1,951	118	295	598	2,989
1988	32	3,812	127	2,237	2,548	8,756
1989	33	1,213	59	1,660	39	3,004
1990	29	1,287	28	306	31	1,681
1991[a]	19	1,115	36	275	48	1,493
1992[a]	30	1,152	19	212	53	1,466
1993[a]	27	802	41	287	7	1,164
1994[a]	18	496	93	745	9	1,361
1995[a]	48	1,381	62	1,245	24	2,760
1996[a]	26	2,113	42	100	5	2,286
1997[a]	23	1,066	36	1,286	10	2,421
1998[a]	20	1,224	37	712	9	2,002
1999[a]	51	2,459	23	470	20	3,023
2000[a]	31	1,112	19	431	192	1,786
2001[a]	24	627	15	277	295	1,238
2002[a]	24	817	18	441	58	1,359
2003[a]	15	1,965	18	154	40	2,192
2004[a]	32	503	40	352	339	1,266
2005[a]	14	848	27	542	196	1,627
20 Year Avg.	29	1,407	52	685	230	2,404
1985–1994 Avg.	28	1,488	74	824	361	2,775
1995–2004 Avg.	30	1,327	31	547	99	2,033
2005 % of Total	0.86%	52.06%	1.66%	33.35%	12.06%	100.00%

Source: Values obtained by using the formula: (average price per lb.) x (average weight per fish) x (catch) = Exvessel value; average prices are determined only from fish ticket information and may not reflect retroactive or postseason adjustments.

[a] Includes hatchery cost recovery.

Appendix A3.–Average salmon price in dollars per pound by species, Lower Cook Inlet, 1985–2005.

Year	Chinook	Sockeye	Coho	Pink	Chum
1985	1.60	1.25	0.85	0.22	0.31
1986	1.25	1.40	0.85	0.26	0.30
1987	1.25	1.60	1.00	0.42	0.46
1988	1.25	2.50	1.80	0.80	0.84
1989	1.25	1.60	0.70	0.40	0.40
1990	1.35	1.55	0.60	0.30	0.50
1991	1.12	0.83	0.29	0.13	0.27
1992	1.29	1.47	0.43	0.14	0.27
1993	1.02	0.80	0.51	0.12	0.28
1994	0.95	1.06	0.62	0.15	0.25
1995	1.17	1.11	0.47	0.15	0.24
1996	1.33	0.91	0.40	0.08	0.18
1997	1.29	0.93[a]	0.50[a]	0.15	0.23
1998	1.45	0.96[a]	0.36[a]	0.16	0.27
1999	1.96	1.22[a]	0.45[a]	0.16	0.32
2000	1.86	0.87[a]	0.60[a]	0.12	0.28
2001	1.76	0.62[a]	0.41[a]	0.15	0.28
2002	1.11	0.55[a]	0.33[a]	0.07	0.16
2003	1.03	0.60[a]	0.28[a]	0.06	0.16
2004	1.56	0.77[a]	0.47[a]	0.04	0.20
2005	1.54	0.86[a]	0.53[a]	0.07	0.23
20-Year Avg.	1.34	1.13	0.59	0.20	0.31
1985-1994 Avg.	1.23	1.41	0.77	0.29	0.39
1995-2004 Avg.	1.45	0.85	0.42	0.11	0.23

Note: Average prices are determined only from fish ticket information and may not reflect retroactive or postseason adjustments.

[a] Average price for sockeye and coho include only those fish actually sold and therefore does not include fish retained for personal use or hatchery cost recovery fish that were donated, discarded, or harvested but not paid for due to contractual agreement with the processor.

Appendix A4.–Salmon average weight in pounds per fish by species in the commercial fishery, Lower Cook Inlet, 1985–2005.

Year	Chinook	Sockeye	Coho	Pink	Chum
1985	28.0	4.7	9.8	3.5	8.2
1986	20.6	4.3	8.6	3.4	8.1
1987	18.1	4.9	8.2	3.5	8.3
1988	15.3	4.8	8.9	3.0	9.4
1989	14.1	4.6	7.0	3.1	8.6
1990	13.8	4.1	7.1	2.8	8.9
1991	12.3	4.2	6.6	2.6	7.5
1992	12.3	4.4	7.7	3.2	8.8
1993	12.0	4.4	6.0	2.7	6.2
1994	15.0	4.1	10.2	3.0	6.4
1995	17.8	4.7	7.4	2.9	6.4
1996	16.9	5.2	7.6	2.9	8.0
1997	13.9	4.9	7.8	3.1	7.6
1998	13.1	4.6	8.5	3.1	7.4
1999	14.8	4.7	6.6	2.5	7.9
2000	14.7	5.3	8.2	2.5	9.3
2001	13.6	4.9	7.5	3.1	9.4
2002	14.0	5.2	7.8	3.4	8.3
2003	12.6	5.1	6.8	3.2	7.2
2004	12.4	5.0	7.5	3.4	8.2
2005	14.5	4.3	6.7	3.4	8.6
20-Year Avg.	15.3	4.7	7.8	3.0	8.0
1985-1994 Avg.	16.2	4.4	8.0	3.1	8.0
1995-2004 Avg.	14.4	5.0	7.6	3.0	8.0

Source: Values obtained from ADF&G fish ticket database *Unpublished*.

Appendix A5.–Commercial salmon catch in numbers of fish by species, Lower Cook Inlet, 1985–2005.

Year	Chinook	Sockeye	Coho	Pink	Chum	Total
1985	1,043	278,694	10,327	1,229,708	30,640	1,550,412
1986	796	234,861	18,852	1,408,293	82,688	1,745,490
1987	1,179	248,848	14,354	201,429	157,018	622,828
1988	1,694	319,008	7,946	921,296	321,911	1,571,855
1989	1,893	163,271	12,089	1,296,926	11,305	1,485,484
1990	1,560	203,895	9,297	383,670	6,951	605,373
1991	1,419	317,947	19,047	828,709	24,232	1,191,354
1992	1,891	176,644	5,902	479,768	22,203	686,408
1993	2,168	233,834	13,477	866,774	4,367	1,120,620
1994	1,231	115,418	14,673	1,647,929	5,469	1,784,720
1995	2,303	265,423	17,709	2,848,464	15,636	3,149,535
1996	1,181	449,685	13,572	451,506	3,764	919,708
1997	1,261	240,173	11,004	2,814,431	5,908	3,072,777
1998	1,071	284,029	16,653	1,457,819	4,647	1,764,219
1999	1,764	476,779	8,033	1,140,488	7,941	1,635,005
2000	1,188	240,932	8,203	1,387,307	73,254	1,710,884
2001	988	216,271	6,667	592,931	88,969	905,826
2002	1,553	290,654	8,329	1,970,061	43,259	2,313,856
2003	1,180	644,257	11,302	856,711	35,686	1,549,136
2004[a]	1,658	130,083	12,426	2,517,555	206,679	2,868,401
2005[a]	622	232,678	9,126	2,306,842	98,602	2,647,870
20-Year Avg.	1,451	276,535	11,993	1,265,089	57,627	1,612,695
1985-1994 Avg.	1,487	229,242	12,596	926,450	66,678	1,236,454
1995-2004 Avg.	1,415	323,829	11,390	1,603,727	48,574	1,988,935
2005 % of Total	0.02%	8.79%	0.34%	87.12%	3.72%	100.00%

Source: ADF&G fish ticket database *Unpublished*.

[a] 2004 and 2005 totals do not include a very small number of fish retained for personal use.

Appendix A6.–Commercial salmon catch in numbers of fish by species in the Southern District, Lower Cook Inlet, 1985–2005.

Year	Chinook	Sockeye	Coho	Pink	Chum	Total
1985	1,007	84,149	4,258	518,889	5,513	613,816
1986	776	36,838	3,095	542,521	5,560	588,790
1987	1,158	89,662	2,163	90,522	5,030	188,535
1988	1,655	105,302	2,987	852,382	7,742	970,068
1989	1,889	98,052	6,667	987,488	3,141	1,097,237
1990	1,546	82,412	1,552	178,087	2,433	266,030
1991	1,399	170,224	9,415	253,962	1,962	436,962
1992	1,852	106,793	1,277	417,021	1,885	528,828
1993	2,162	159,747	4,431	692,794	2,788	861,922
1994	1,230	64,531	1,373	1,589,709	2,631	1,659,474
1995	2,289	164,798	5,161	2,475,312	4,530	2,652,090
1996	1,180	358,163	9,543	444,236	3,511	816,633
1997	1,261	188,402	5,597	2,685,764	4,260	2,885,284
1998	1,070	196,262	2,243	1,315,042	3,956	1,518,534
1999	1,760	243,444	2,757	1,105,267	4,624	1,357,852
2000	1,184	123,574	768	1,070,065	5,340	1,200,931
2001	986	155,411	2,706	542,975	3,789	705,867
2002	1,553	218,203	3,769	953,960	4,803	1,182,288
2003	1,179	556,037	5,408	563,043	5,730	1,131,397
2004[a]	1,656	50,699	1,431	2,461,950	1,372	2,517,108
2005[a]	621	110,739	2,722	2,175,386	1,750	2,291,218
20-Year Avg.	1,440	162,635	3,830	987,049	4,030	1,158,984
1985-1994 Avg.	1,467	99,771	3,722	612,338	3,869	721,166
1995-2004 Avg.	1,412	225,499	3,938	1,361,761	4,192	1,596,802
2005 % of Total	0.03%	4.83%	0.12%	94.94%	0.08%	100.00%

Source: ADF&G fish ticket database *Unpublished*.

[a] 2004 and 2005 totals do not include a very small number of fish retained for personal use.

Appendix A7.–Commercial set gillnet catch of salmon in numbers of fish by species in the Southern District, Lower Cook Inlet, 1985–2005.

Year	Chinook	Sockeye	Coho	Pink	Chum	Total
1985	958	23,188	3,908	22,898	4,221	55,173
1986	745	21,807	2,827	14,244	2,426	42,049
1987	653	28,209	2,025	9,224	2,419	42,530
1988	1,145	14,758	2,819	29,268	4,423	52,413
1989	1,281	13,970	4,792	16,210	1,877	38,130
1990	1,361	15,863	1,046	12,646	1,938	32,854
1991	842	20,525	5,011	3,954	1,577	31,909
1992	1,288	17,002	848	15,958	1,687	36,783
1993	1,089	14,791	3,088	12,008	2,591	33,567
1994	1,103	14,004	1,073	23,621	2,419	42,220
1995	2,078	19,406	3,564	41,654	3,958	70,660
1996	1,054	69,338	5,779	14,813	2,792	93,776
1997	1,135	59,401	4,475	64,162	4,166	133,339
1998	952	26,131	1,057	24,403	3,754	56,297
1999	1,491	27,646	1,374	5,348	4,313	40,194
2000	1,019	26,503	621	21,845	5,214	55,202
2001	865	28,503	1,811	13,393	3,487	48,059
2002	1,513	46,812	2,393	6,741	4,681	62,140
2003	878	81,722	2,291	7,325	4,998	97,214
2004[a]	1,400	16,087	1,164	834	1,234	20,719
2005[a]	525	15,669	1,905	341	1,326	19,766
20-Year Avg.	1,143	29,283	2,598	18,027	3,210	54,261
1985-1994 Avg.	1,047	18,412	2,744	16,003	2,558	40,763
1995-2004 Avg.	1,239	40,155	2,453	20,052	3,862	67,760
2005 % of Total	2.65%	79.28%	9.64%	1.73%	6.71%	100.00%

Source: ADF&G fish ticket database *Unpublished*.

[a] 2004 and 2005 totals do not include a very small number of fish retained for personal use.

Appendix A8.–Commercial salmon catch in numbers of fish by species in the Outer District, Lower Cook Inlet, 1985–2005.

Year	Chinook	Sockeye	Coho	Pink	Chum	Total
1985	19	91,957	3,210	618,222	11,844	725,252
1986	6	48,472	5,052	401,755	11,701	466,986
1987	14	31,845	2,481	23,890	28,663	86,893
1988	5	9,501	2	6,094	71,202	86,804
1989	1	10,286	72	52,677	43	63,079
1990	2	17,404	74	191,320	614	209,414
1991	2	6,408	12	359,664	14,337	380,423
1992	0	572	1	146	181	900
1993	2	4,613	119	159,159	970	164,863
1994	0	5,930	993	13,200	32	20,155
1995	12	17,642	1,272	192,098	474	211,498
1996	0	14,999	96	7,199	3	22,297
1997	0	6,255	63	128,373	1,575	136,266
1998	0	15,991	45	102,172	611	118,819
1999	3	51,117	1,482	32,484	2,062	87,148
2000	2	21,623	20	306,555	302	328,502
2001	0	7,339	5	48,559	408	56,311
2002	0	21,154	74	569,955	3,810	594,993
2003	1	26,615	4	281,663	137	308,420
2004	2	11,082	13	42,636	27,911	81,644
2005	0	1	3	110,195	12,524	122,723
20-Year Avg.	4	21,040	755	176,891	8,844	207,533
1985-1994 Avg.	5	22,699	1,202	182,613	13,959	220,477
1995-2004 Avg.	2	19,382	307	171,169	3,729	194,590
2005 % of Total	0.00%	0.00%	0.00%	89.79%	10.21%	100.00%

Source: ADF&G fish ticket database *Unpublished.*

Appendix A9.–Commercial salmon catch in numbers of fish by species in the Eastern District, Lower Cook Inlet, 1985–2005.

Year	Chinook	Sockeye	Coho	Pink	Chum	Total
1985	11	24,338	835	92,403	5,144	122,731
1986	0	3,055	770	40,243	3,757	47,825
1987	0	3,687	1,631	14,333	14,913	34,564
1988	1	20,253	486	1,740	24,668	47,148
1989	0	8,538	5,346	92	312	14,288
1990	0	7,682	7,645	11,815	307	27,449
1991	1	4,703	7,283	167,250	80	179,317
1992	0	432	3,136	60,007	86	63,661
1993	0	1,824	8,924	10,616	9	21,373
1994	1	9,661	10,410	44,987	2,792	67,851
1995	0	46,556	5,192	12,000	330	64,078
1996	0	44,919	3,932	36	223	49,110
1997	0	33,783	5,344	1	66	39,194
1998	1	44,274	14,365	38,829	51	97,520
1999	1	135,305	3,794	1,930	1,232	142,262
2000	1	64,099	7,408	4,473	1,540	77,521
2001	0	13,809	3,947	0	6	17,762
2002	0	17,376	4,432	0	5	21,813
2003	0	10,352	5,886	0	19	16,257
2004	0	16,645	5,615	0	1	22,261
2005[a]	0	56,951	6,309	13,500	385	77,145
20-Year Avg.	1	25,565	5,319	25,038	2,777	58,699
1985-1994 Avg.	1	8,417	4,647	44,349	5,207	62,621
1995-2004 Avg.	0	42,712	5,992	5,727	347	54,778
2005 % of Total	0.00%	73.82%	8.18%	17.50%	0.50%	100.00%

Source: ADF&G fish ticket database *Unpublished*.

[a] 2005 totals do not include a very small number of fish retained for personal use.

Appendix A10.–Commercial salmon catch in numbers of fish by species in the Kamishak Bay District, Lower Cook Inlet, 1985–2005.

Year	Chinook	Sockeye	Coho	Pink	Chum	Total
1985	6	78,250	2,024	194	8,139	88,613
1986	14	146,496	9,935	423,774	61,670	641,889
1987	7	123,654	8,079	72,684	108,412	312,836
1988	33	183,952	4,471	61,080	218,299	467,835
1989	3	46,395	4	256,669	7,809	310,880
1990	12	96,397	26	2,448	3,597	102,480
1991	17	136,612	2,337	47,833	7,853	194,652
1992	39	68,847	1,488	2,594	20,051	93,019
1993	4	67,650	3	4,205	600	72,462
1994	0	35,296	1,897	33	14	37,240
1995	2	36,427	6,084	169,054	10,302	221,869
1996	1	31,604	1	35	27	31,668
1997	0	11,733	0	293	7	12,033
1998	0	27,502	0	1,776	29	29,307
1999	0	46,913	0	807	23	47,743
2000	1	31,636	7	6,214	66,072	103,930
2001	2	39,712	9	1,397	84,766	125,886
2002	0	33,921	54	446,146	34,641	514,762
2003	0	51,253	4	12,005	29,800	93,062
2004	0	51,657	5,367	12,969	177,395	247,388
2005	1	64,987	92	7,761	83,943	156,784
20-Year Avg.	7	67,295	2,090	76,111	41,975	187,478
1985-1994 Avg.	14	98,355	3,026	87,151	43,644	232,191
1995-2004 Avg.	1	36,236	1,153	65,070	40,306	142,765
2005 % of Total	0.00%	41.45%	0.06%	4.95%	53.54%	100.00%

Source: ADF&G fish ticket database *Unpublished*.

Appendix A11.–Total commercial salmon catch in numbers of fish by district, Lower Cook Inlet, 1985–2005.

Year	Southern	Outer	Kamishak	Eastern	Total
1985	613,816	725,252	88,613	122,731	1,550,412
1986	588,790	466,986	641,889	47,825	1,745,490
1987	188,535	86,893	312,836	34,564	622,828
1988	970,068	86,804	467,835	47,148	1,571,855
1989	1,097,237	63,079	310,880	14,288	1,485,484
1990	266,030	209,414	102,480	27,449	605,373
1991	436,962	380,423	194,652	179,317	1,191,354
1992	528,828	900	93,019	63,661	686,408
1993	861,922	164,863	72,462	21,373	1,120,620
1994	1,659,474	20,155	37,240	67,851	1,784,720
1995	2,652,090	211,498	221,869	64,078	3,149,535
1996	816,633	22,297	31,668	49,110	919,708
1997	2,885,284	136,266	12,033	39,194	3,072,777
1998	1,518,573	118,819	29,307	97,520	1,764,219
1999	1,357,852	87,148	47,743	142,262	1,635,005
2000	1,200,931	328,502	103,930	78,227	1,711,590
2001	705,867	56,311	125,886	17,762	905,826
2002	1,182,288	594,993	514,762	21,813	2,313,856
2003	1,131,397	308,420	93,062	16,257	1,549,136
2004	2,517,108[a]	81,644	247,388	22,261	2,868,401
2005	2,291,218[a]	122,723	156,784	77,145[a]	2,647,870
20-Year Avg.	1,158,984	207,533	187,478	58,699	1,612,695
1985-1994 Avg.	721,166	220,477	232,191	62,621	1,236,454
1995-2004 Avg.	1,596,802	194,590	142,765	54,778	1,988,935
2005 % of Total	86.53%	4.63%	5.92%	2.91%	100.00%

Source: ADF&G fish ticket database *Unpublished*.

[a] 2004 and 2005 totals do not include a very small number of fish retained for personal use.

Appendix A12.–Commercial Chinook salmon catch in numbers of fish by district, Lower Cook Inlet, 1985–2005.

Year	Southern	Outer	Kamishak	Eastern	Total
1985	1,007	19	6	11	1,043
1986	776	6	14	0	796
1987	1,158	14	7	0	1,179
1988	1,655	5	33	1	1,694
1989	1,889	1	3	0	1,893
1990	1,546	2	12	0	1,560
1991	1,399	2	17	1	1,419
1992	1,852	0	39	0	1,891
1993	2,162	2	4	0	2,168
1994	1,230	0	0	1	1,231
1995	2,289	12	2	0	2,303
1996	1,180	0	1	0	1,181
1997	1,261	0	0	0	1,261
1998	1,070	0	0	1	1,071
1999	1,760	3	0	1	1,764
2000	1,184	2	1	1	1,188
2001	986	0	2	0	988
2002	1,553	0	0	0	1,553
2003	1,179	1	0	0	1,180
2004	1,656[a]	2	0	0	1,658
2005	621[a]	0	1	0	622
20-Year Avg.	1,440	4	7	1	1,451
1985-1994 Avg.	1,467	5	14	1	1,487
1995-2004 Avg.	1,412	2	1	0	1,415
2005 % of Total	99.84%	0.00%	0.16%	0.00%	100.00%

Source: ADF&G fish ticket database *Unpublished*.

[a] 2004 and 2005 totals do not include a very small number of fish retained for personal use.

Appendix A13.–Commercial sockeye salmon catch in numbers of fish by district, Lower Cook Inlet, 1985–2005.

Year	Southern	Outer	Kamishak	Eastern	Total
1985	84,149	91,957	78,250	24,338	278,694
1986	36,838	48,472	146,496	3,055	234,861
1987	89,662	31,845	123,654	3,687	248,848
1988	105,302	9,501	183,952	20,253	319,008
1989	98,052	10,286	46,395	8,538	163,271
1990	82,412	17,404	96,397	7,682	203,895
1991	170,224	6,408	136,612	4,703	317,947
1992	106,793	572	68,847	432	176,644
1993	159,747	4,613	67,650	1,824	233,834
1994	64,531	5,930	35,296	9,661	115,418
1995	164,798	17,642	36,427	46,556	265,423
1996	358,163	14,999	31,604	44,919	449,685
1997	188,402	6,255	11,733	33,783	240,173
1998	196,262	15,991	27,502	44,274	284,029
1999	243,444	51,117	46,913	135,305	476,779
2000	123,574	21,623	31,636	64,099	240,932
2001	155,411	7,339	39,712	13,809	216,271
2002	218,203	21,154	33,921	17,376	290,654
2003	556,037	26,615	51,253	10,352	644,257
2004	50,699[a]	11,082	51,657	16,645	130,083
2005	110,739[a]	1	64,987	56,951[a]	232,678
20-Year Avg.	162,635	21,040	67,295	25,565	276,535
1985-1994 Avg.	99,771	22,699	98,355	8,417	229,242
1995-2004 Avg.	225,503	19,382	36,236	42,712	323,832
2005 % of Total	47.59%	0.00%	27.93%	24.48%	100.00%

Source: ADF&G fish ticket database *Unpublished*.

[a] 2004 and 2005 totals do not include a very small number of fish retained for personal use.

Appendix A14.–Commercial sockeye salmon catch in thousands of fish by subdistrict, Lower Cook Inlet, 1959–2005.

Location	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
Resurrection Bay	0	0.1	0	0	0	0	0	0	0	74.5	99.4	1.8	2.2
Aialik Bay	1.3	0.2	4.3	2.6	0.5	0	0	0	0	0	0	3.1	0
Nuka Bay	8.3	6.7	8.2	5.1	0.5	0	2.0	0	2.2	1.5	0	1.0	1.6
Port Dick	0	0	0	0	0	0	0	0	0	0	0	0	0
Halibut Cove &	1.3	1.4	0.8	2.0	1.1	0.7	1.4	1.5	1.9	2.7	1.7	1.3	1.3
Tutka/Barabara	1.1	1.7	3.0	5.2	2.9	9.0	5.2	6.0	11.8	6.3	5.6	6.0	10.0
Seldovia Bay	0.4	1.2	1.2	1.7	1.2	2.1	0.9	1.0	2.2	1.9	1.1	1.2	1.5
Port Graham Bay	6.6	7.8	5.2	6.8	7.8	5.5	3.5	2.7	10.4	7.7	4.3	3.7	5.6
Kamishak/Douglas	0	0	0	0	0	0	0	0	0	0	0	0	0
McNeil (Mikfik)	0	0.7	0	0	0	1.9	0.2	0	0	0	8.9	2.8	0
Paint River	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenik Lake	0	0	0	0	0	0	0	0	0.2	0	1.9	0	0
Bruin/Kirschner	0	0	0	0	0	0	0	0	0	0	0	0	0
Miscellaneous	2.6	4.9	0.1	1.9	1.1	1.5	0.8	4.1	0.3	0.6	0.1	0	0
Totals	21.6	24.7	22.8	25.3	15.1	20.7	14.0	15.3	29.0	95.2	122.8	20.9	22.2

Location	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
Resurrection Bay	0.1	0	0	0	0	0	0	0	0	0.6	0	0	3.4
Aialik Bay	0.3	3.1	0.2	0.6	0	5.8	0	0	0.1	8.7	3.0	25.9	50.8
Nuka Bay	26.1	1.1	0.1	0	18.9	31.1	10.6	24.4	21.5	17.2	66.3	16.8	29.2
Port Dick	0	0	0	0	0	0	0	0	0	0	0	0	0
Halibut Cove &	3.7	2.1	3.0	3.4	5.1	3.6	12.9	5.3	11.5	11.2	1.2	77.7	116.6
Tutka/Barabara	14.8	8.1	10.8	12.6	14.2	21.3	92.1	15.6	13.2	41.0	15.8	35.9	26.7
Seldovia Bay	2.3	2.2	2.3	2.1	2.1	3.0	5.6	2.6	1.6	5.3	5.0	6.7	4.9
Port Graham Bay	10.5	11.7	10.9	9.2	13.6	16.6	30.5	12.9	16.5	20.3	21.5	13.4	12.5
Kamishak/Douglas	0	0	0	0	0.2	5.3	4.6	0.5	0	4.9	0	2.8	0
McNeil (Mikfik)	0	0	0	0	3.8	2.1	0	1.2	3.9	0	17.8	5.8	10.7
Paint River	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenik Lake	0	0	0	0	0	0	0	0	0	0	0.3	2.7	13.9
Bruin/Kirschner	0	0	0	0	0	0	0	0	0	0	0	0	0
Miscellaneous	0.1	0.8	0.1	0.2	0.3	2.8	0.1	1.9	1.1	1.1	0.4	0	0.3
Totals	57.9	29.1	27.4	28.1	58.2	101.6	156.4	64.4	69.4	110.3	131.3	187.6	269.0

-continued-

Appendix A14.–Page 2 of 2.

Location	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Resurrection Bay	0.3	0	0.2	0	0	0	0	0	1.7	9.0	44.6	43.9	31.7
Aialik Bay	24.1	3.0	3.5	20.2	8.5	7.7	4.7	0.4	0.2	0.6	2.0	1.0	2.1
Nuka Bay	91.8	48.4	31.8	9.5	10.3	5.7	1.8	0	3.5	5.9	17.6	15.0	6.2
Port Dick	0	0	0	0	0	11.7	4.6	0.6	1.0	0	0	0	0
Halibut Cove &	63.2	15.2	69.1	24.9	46.6	20.3	36.0	14.7	19.0	12.2	9.0	75.3	12.3
China Poot[c]				63.6	35.8	49.9	116.7	76.0	127.6	38.7	133.4	225.2	116.1
Tutka/Barabara	14.9	16.3	14.7	12.9	13.4	7.9	13.4	12.9	8.4	11.0	15.4	27.8	14.4
Seldovia Bay	2.6	3.2	3.5	2.5	1.8	4.3	4.0	3.3	4.4	2.7	4.2	11.9	12.5
Port Graham Bay	3.5	2.0	2.4	1.4	0	0	0	0	0	0	2.6	17.9	33.1
Kamishak/Douglas	0.7	7.6	2.3	5	0	0.1	7.0	9.9	1.3	3.4	2.7	0	2.6
McNeil (Mikfik)	67.0	27.5	21.4	14.6	7.0	9.1	12.9	4.0	0.9	0	0.1	0	0.2
Paint River	0	0	0	0	0	0	0.4	0	0	0	0	0	0
Chenik Lake	10.6	111.3	98.5	164.2	38.9	70.3	60.4	14.4	24.6	0	0	0	0
Bruin/Kirschner	0	0	0	0	0.2	14.5	55.9	40.5	39.7	31.9	33.6	31.6	9.0
Miscellaneous	0	0.4	1.6	0.2	0.8	2.4	0.1	0	1.5	0	0.2	0	0
Totals	278.7	234.9	248.8	319.0	163.3	203.9	317.9	176.6	233.8	115.4	265.4	449.7	240.2

Location	1998	1999	2000	2001	2002	2003	2004	2005
Resurrection Bay	35.0	135.2	64.1	13.8	16.2	10.4	16.6	56.7
Aialik Bay	8.6	0.1	T	0	1.2	0	0	0.3
Nuka Bay	16.0	51.1	21.6	7.3	21.2	26.6	11.1	0
Port Dick	0	0	T	T	0	0	T	T
Halibut Cove &	62.3	42.9	24.3	5.8	27.5	74.2	2.7	7.6
China Poot[c]	100.2	170.6	78.3	117.7	126.5	366.2	33.4	90.6
Tutka/Barabara	9.8	22.9	12.4	23.0	19.4	33.4	7.2	9.2
Seldovia Bay	6.0	6.3	6.4	9.0	9.5	13.8	4.9	3.4
Port Graham Bay	17.9	0.7	2.1	0	35.3	68.5	2.6	0
Kamishak/Douglas	0	0	T	0.5	1.4	0.8	2.1	2.9
McNeil (Mikfik)	0	7.2	0	0.3	0	0	0	0
Paint River	0	0	0	0	0	0	0	0
Chenik Lake	0	0	0	0	0	0	33.2	47.0
Bruin/Kirschner	27.5	39.8	31.6	38.9	32.5	50.4	16.4	15.0
Miscellaneous	0.7	0	T	0	0	0	T	0.1
Totals	284.0	476.8	240.9	216.3	290.7	644.3	130.1	232.8

Source: ADF&G fish ticket database *Unpublished.*

Note: "T" denotes trace, less than 50 fish caught.

[a] China Poot Subdistrict, which includes China Poot, Peterson, and Neptune Bays, was part of Halibut Cove Subdistrict prior to 1988.

Appendix A15.–Harvest of sockeye salmon returning to China Poot and Neptune Bays in the Southern District of Lower Cook Inlet, by user group, 1979–2005.

Return Year	Sport Harvest	Personal Use Harvest	Commercial Harvest	Unharvested fish	Total Return
1979	650	0	[a]	0	650
1980	1,000	1,000	12,000	0	14,000
1981	1,500	0	10,000	0	11,500
1982	450	1,320	200	1,430	3,400
1983	480	5,910	84,020	10	90,420
1984	500	2,000	114,360	500	117,360
1985	500	3,000	61,500	920	65,920
1986	100	150	18,350	200	18,800
1987	200	2,000	21,500	0	23,700
1988	500	1,500	91,469	470	93,939
1989	1,000	7,000	79,714	0	87,714
1990	500	3,000	49,587	0	53,087
1991	1,000	4,000	117,000[b]	0	122,000
1992	300	3,500	89,791[b]	0	93,591
1993	400	4,000	144,677[b]	0	149,077
1994	500	8,500	50,527[b]	0	59,527
1995	1,000	7,000	145,392[b]	450	153,842
1996	1,000	9,000	200,000[b]	441	210,441
1997	650[c]	4,900[d]	120,900[b]	1,130	127,620
1998	650[c]	4,900[d]	164,000[b]	380	170,542
1999	650[c]	4,900[d]	219,300[b]	522	225,983
2000	650[c]	4,900[d]	97,100[b]	256	102,906
2001	650[c]	4,900[d]	126,900[b]	57	132,507
2002	650[c]	4,900[d]	151,100[b]	51	156,701
2003	650[c]	4,900[d]	427,327[b]	121	432,998
2004	650[c]	4,900[d]	34,612[b]	448	40,610
2005	650[c]	4,900[d]	95,070[b]	1	100,621
1985-2004 Average	610	4,595	120,525	272	126,002

Note: Through 1990, "Commercial Harvest" and "Total Return" includes returns only to Leisure Lake in China Poot Bay; after 1990, these figures include combined returns to both Leisure Lake in China Poot Bay and Hazel Lake in Neptune Bay.

[a] No data.

[b] Portions of the commercial sockeye harvest in China Poot, Halibut Cove, and Tutka Bay Subdistricts were attributed to the Leisure and/or Hazel Lake returns.

[c] The final "Sport Harvest" figures for 1997–2005 represent the estimated previous 10-year average.

[d] The final "Personal Use Harvest" figures for 1997–2005 represent the statewide sport fish harvest survey average for the years 1990–1995.

Appendix A16.–Commercial catch and escapement of sockeye salmon at Chenik Lake in the Kamishak Bay District of Lower Cook Inlet, 1975–2005.

Return Year	Commercial Harvest	Escapement[a]	Total Return
1975	[b]	100	100
1976	[b]	900	900
1977	[b]	200	200
1978	[b]	100	100
1979	[b]	[c]	[c]
1980	[b]	3,500	3,500
1981	[b]	2,500	2,500
1982	[b]	8,000	8,000
1983	2,800	11,000	13,800
1984	16,500	13,000	29,500
1985	10,500	3,500	14,000
1986	111,000	7,000	118,000
1987	102,000	10,000	112,000
1988	164,200	9,000	173,200
1989	38,905	12,000	50,905
1990	70,347	17,000	87,347
1991	60,397	10,189	70,586
1992	13,793	9,269	23,062
1993	24,567	4,000	28,567
1994	0[d]	808	808
1995	0[d]	1,086	1,086
1996	0[d]	2,990	2,990
1997	0[d]	2,338	2,338
1998	0[d]	1,880	1,880
1999	0[d]	2,850	2,850
2000	0[d]	4,800	4,800
2001	0[d]	250	250
2002	0[d]	4,650	4,650
2003	0[e]	13,825	13,825
2004	33,177	17,000	50,177
2005	47,013	14,507[f]	61,520
Avg. Since 1985	31,444	6,722	38,166

[a] Estimated from aerial surveys between 1975-1990 and 1998-present, weir counts between 1991-1997, unless otherwise noted.

[b] Closed to fishing.

[c] No data.

[d] Due to low returns, the Chenik Subdistrict was kept closed to fishing for the entire season.

[e] Due to the previous decade of low returns to Chenik Lake, the Chenik Subdistrict was kept closed to all fishing to protect fish for escapement.

[f] Estimated from a combination of weir and video counts.

Appendix A17.–Commercial coho salmon catch in numbers of fish by district, Lower Cook Inlet, 1985–2005.

Year	Southern	Outer	Kamishak	Eastern	Total
1985	4,258	3,210	2,024	835	10,327
1986	3,095	5,052	9,935	770	18,852
1987	2,163	2,481	8,079	1,631	14,354
1988	2,987	2	4,471	486	7,946
1989	6,667	72	4	5,346	12,089
1990	1,552	74	26	7,645	9,297
1991	9,415	12	2,337	7,283	19,047
1992	1,277	1	1,488	3,136	5,902
1993	4,431	119	3	8,924	13,477
1994	1,373	993	1,897	10,410	14,673
1995	5,161	1,272	6,084	5,192	17,709
1996	9,543	96	1	3,932	13,572
1997	5,597	63	0	5,344	11,004
1998	2,243	45	0	14,365	16,653
1999	2,757	1,482	0	3,794	8,033
2000	768	20	7	7,408	8,203
2001	2,706	5	9	3,947	6,667
2002	3,769	74	54	4,432	8,329
2003	5,408	4	4	5,886	11,302
2004	1,441[a]	13	5,367	5,615	12,436
2005	2,722[a]	3	92	6,309	9,126
20-Year Avg.	3,830	755	2,090	5,319	11,993
1985-1994 Avg.	3,722	1,202	3,026	4,647	12,596
1995-2004 Avg.	3,938	307	1,153	5,992	11,391
2005 % of Total	29.83%	0.03%	1.01%	69.13%	100.00%

Source: ADF&G fish ticket database *Unpublished*.

[a] 2004 and 2005 totals do not include a very small number of fish retained for personal use.

Appendix A18.–Commercial pink salmon catch in numbers of fish by district, Lower Cook Inlet, 1985–2005.

Year	Southern	Outer	Kamishak	Eastern	Total
1985	518,889	618,222	194	92,403	1,229,708
1986	542,521	401,755	423,774	40,243	1,408,293
1987	90,522	23,890	72,684	14,333	201,429
1988	852,382	6,094	61,080	1,740	921,296
1989	987,488	52,677	256,669	92	1,296,926
1990	178,087	191,320	2,448	11,815	383,670
1991	253,962	359,664	47,833	167,250	828,709
1992	417,021	146	2,594	60,007	479,768
1993	692,794	159,159	4,205	10,616	866,774
1994	1,589,709	13,200	33	44,987	1,647,929
1995	2,475,312	192,098	169,054	12,000	2,848,464
1996	444,236	7,199	36	35	451,506
1997	2,685,764	128,373	293	1	2,814,431
1998	1,315,042	102,172	1,776	38,829	1,457,819
1999	1,105,267	32,484	807	1,930	1,140,488
2000	1,070,065	306,555	6,214	4,473	1,387,307
2001	542,975	48,559	1,397	0	592,931
2002	953,960	569,955	446,146	0	1,970,061
2003	563,043	281,663	12,005	0	856,711
2004	2,461,950[a]	42,636	12,969	0	2,517,555
2005	2,175,386[a]	110,195	7,761	13,500	2,306,842
20-Year Avg.	987,049	176,891	76,111	25,038	1,265,089
1985-1994 Avg.	612,338	182,613	87,151	44,349	926,450
1995-2004 Avg.	1,361,761	171,169	65,070	5,727	1,603,727
2005 % of Total	94.30%	4.78%	0.34%	0.59%	100.00%

Source: ADF&G fish ticket database *Unpublished*.

[a] 2004 and 2005 totals do not include a very small number of fish retained for personal use.

Appendix A19.–Commercial pink salmon catch in thousands of fish by subdistrict during odd-numbered years, Lower Cook Inlet, 1959–2005.

Location	1959	1961	1963	1965	1967	1969	1971	1973	1975	1977
Humpy Creek	13.2	34.5	20.6	6.7	6.9	0.6	0	37.3	242.1	26.4
Halibut Cove & Lagoon		33.4	36.9	7.1	33.4	0	11.4	7.2	97.2	16.3
Tutka/Barabara	14.4	106.8	37.7	44.6	31.6	32.9	3.9	20.0	89.2	21.9
Seldovia Bay	4.9	15.1	1.6	19.2	11.7	28.8	27.4	19.4	429.6	47.6
Port Graham Bay	5.3	1.0	2.7	12.4	5.1	2.0	1.0	13.9	18.3	44.8
Dogfish Bay	1.6	0	0	0.1	2.3	0	10.4	0.3	0	5.0
Port Chatham	1.2	0	0.8	0	0	0	26.3	20.6	16.0	1.4
Windy Bay	3.1	2.2	0	5.4	0	0	57.3	68.5	18.1	173.2
Rocky Bay	2.3	0	1.4	0.1	0	0	0.1	0.2	0	11.6
Port Dick Bay	28.2	92.9	19.0	15.3	259.9	51.5	94.6	96.6	90.3	881.7
Nuka Island	33.3	2.0	0.3	0	0.1	0	25.0	5.2	31.4	40.6
E. Nuka Bay	ND	ND	ND	ND	ND	ND	94.6	T	0	8.7
Resurrection Bay	8.4	0	0	0	1.2	0	0	0	0	0
Bruin Bay	0	0	12.3	0.9	2.1	0	11.7	0	0	6.2
Rocky/Ursus Coves	3.7	2.7	44.2	0	13.0	52.8	16.4	7.9	0	0
Iniskin/Cottonwood	1.5	3.3	21.8	0	0.1	26.0	0	4.7	0	0.1
Miscellaneous	3.6	9.5	4.3	3.8	8.1	7.8	12.8	5.6	31.1	8.4
Total	124.7	303.4	203.6	115.6	375.5	202.4	392.9	307.4	1,063.3	1,293.9

Location	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997
Humpy Creek	277.0	239.9	8.1	5.6	0	91.4	0	0.2	13.7	0
Halibut Cove & Lagoon	27.1	11.1	18.8	5.9	30.5	254.4	91.1	100.2	1.9	2.6
China Poot[a]	[a]	[a]	[a]	[a]	[a]	8.5	135.7	50.6	12.9	14.5
Tutka/Barabara	416.8	1,026.6	616.0	491.2	56.5	632.1	117.6	539.4	2,428.5	2,511.2
Seldovia Bay	140.8	126.4	43.3	3.8	1.2	1.1	0.3	2.4	8.2	12.3
Port Graham Bay	124.7	45.9	4.1	12.5	2.3	0	0	0	10.2	145.1
Dogfish Bay	7.4	22.9	0.2	0	0	0	0	0	0	0
Port Chatham	174.4	47.6	3.3	7.0	0	9.7	7.5	14.7	17.6	0
Windy Bay	552.7	82.9	0	4.8	0	0	49.1	43.4	111.2	93.2
Rocky Bay	122.2	16.5	1.3	0	0	0	0	0	27.5	0
Port Dick Bay	964.8	1,140.9	140.0	455.6	3.0	0	289.7	26.6	0	0.6
Nuka Island	87.2	244.9	30.2	9.6	0	0	10.6	51.9	6.0	33.3
E. Nuka Bay	0.9	121.0	18.1	141.2	20.9	43.0	T	13.8	21.4	1.3
Resurrection Bay	0	32.6	27.1	74.6	11.8	0	0	0.7	0	0
Bruin Bay	40.3	51.9	0.3	0	1.2	202.8	45.1	0.1	104.8	0.3
Rocky/Ursus Coves	14.4	14.1	0	0	69.4	53.8	0	0	58.0	0
Iniskin/Cottonwood	0.2	0	0.3	0	0.2	0	0	0	0	0
Miscellaneous	40.0	54.0	16.5	17.9	4.4	0.1	82.0	22.8	26.6	0
Total	2,990.9	3,279.2	927.6	1,229.7	201.4	1,296.9	828.7	866.8	2,848.5	2,814.4

-continued-

Appendix A19.–Page 2 of 2.

LOCATION	1999	2001	2003	2005
Humpy Creek	0	0	0	0.0
Halibut Cove & Lagoon	3.4	0.2	6.5	0.8
China Poot[a]	19.6	4.8	41.3	26.6
Tutka/Barabara	1,080.8	533.1	511.8	1,637.0
Seldovia Bay	1.5	4.9	2.7	0.3
Port Graham Bay	0	0	0.7	510.9
Dogfish Bay	0	0	0	0.0
Port Chatham	0	0	0	0.0
Windy Bay	0	9.4	119.8	24.0
Rocky Bay	0	0	0	5.2
Port Dick Bay	0	16.7	137.4	81.0
Nuka Island	0	0	0	0.0
E. Nuka Bay	32.5	22.4	24.5	0.0
Resurrection Bay	0	0	0	0.4
Bruin Bay	0.8	0	12.0	3.0
Rocky/Ursus Coves	0	0.1	0	0.0
Iniskin/Cottonwood	0	0	0	4.7
Miscellaneous	1.9	1.3	0	13.1
Total	1,140.5	592.9	856.7	2,307.1

Source: ADF&G fish ticket database *Unpublished*.

Note: "T" denotes trace, less than 50 fish harvested

[a] China Poot Subdistrict, which includes China Poot, Neptune, and Peterson Bays, was part of Halibut Cove Subdistrict prior to 1988.

Appendix A20.–Commercial pink salmon catch in thousands of fish by subdistrict during even-numbered years, Lower Cook Inlet, 1960–2004**.**

Location	1960	1962	1964	1966	1968	1970	1972	1974	1976	1978
Humpy Creek	51.0	73.9	53.5	24.6	2.6	85.2	1.7	33.3	3.3	16.3
Halibut Cove & Lagoon	20.7	35.5	28.9	16.0	41.3	28.9	0.4	2.2	69.8	27.8
Tutka/Barabara	87.6	279.5	100.9	53.5	26.9	43.9	5.2	5.5	18.0	167.9
Seldovia Bay	42.6	142.8	37.4	44.1	23.6	29.0	0.2	3.5	3.0	35.8
Port Graham Bay	7.1	18.1	38.4	5.1	23.0	19.6	1.1	4.5	3.9	4.0
Dogfish Bay	1.8	1.4	0.1	7.1	0	9.8	0.3	0	0	0.3
Port Chatham	15.7	102.2	67.1	6.7	10.0	1.9	0	0	0	0
Windy Bay	29.2	85.5	68.6	20.1	3.4	0.8	0	0	0	0
Rocky Bay	17.0	225.9	53.2	0	10.8	36.8	0	0	0	0
Port Dick Bay	257.4	1,118.3	526.3	296.8	55.0	336.5	0	0.6	0	63.6
Nuka Island	26.6	129.8	23.8	0	90.2	48.4	0	0	0	0
E. Nuka Bay	ND	ND	ND	ND	ND	ND	0.3	T	0.1	3.3
Resurrection Bay	5.8	0.1	0.3	0	37.4	40.2	18.2	0	35.4	29.7
Bruin Bay	2.6	0	0	0	126.2	10.2	0	0	0	0
Rocky/Ursus Coves	6.6	3.2	13.5	2.9	18.0	7.5	0	0	0	0.1
Iniskin/Cottonwood	2.1	3.2	4.3	0	9.9	3.5	0	0	0.1	0.1
Miscellaneous	37.8	28.9	39.1	102.3	107.1	14.0	1.3	1.0	2.8	3.4
Total	611.6	2,248.3	1,055.4	579.2	585.4	716.2	28.7	50.6	136.4	352.6

Location	1980	1982	1984	1986	1988	1990	1992	1994	1996	1998
Humpy Creek	48.6	4.9	53.5	116.7	0	0	0	0	0	0
Halibut Cove & Lagoon	4.7	1.0	10.9	14.0	106.8	91.0	58.4	105.6	2.3	2.4
China Poot[a]	[a]	[a]	[a]	[a]	5.4	46.1	35.7	24.2	8.2	3.3
Tutka/Barabara	312.5	184.9	262.0	400.2	723.9	37.4	320.9	1,454.5	428.2	1,300.6
Seldovia Bay	81.7	70.3	2.2	2.8	5.5	3.6	1.9	5.4	4.1	7.4
Port Graham Bay	30.5	35.4	8.0	8.8	10.7	0	0	0	1.5	0.6
Dogfish Bay	4.7	1.7	0.1	0	0	0	0	0	0	0
Port Chatham	1.8	12.6	0	0	0	22.1	0	0	0	9.4
Windy Bay	0	0	0	0	0	0	0	0	0	0
Rocky Bay	1.4	0	0	0	0	0	0	0	0	35.0
Port Dick Bay	133.3	44.0	84.6	304.0	5.9	169.1	0.1	1.6	0	2.4
Nuka Island	0	0	0	0	0	0	0	0	0	41.1
E. Nuka Bay	12.4	8.7	4.4	97.8	0.1	0.2	0	11.6	7.2	14.2
Resurrection Bay	155.8	137.4	122.3	36.5	0.5	0	0	T	T	0
Bruin Bay	100.6	13.3	125.2	349.7	5.0	0.4	1.9	T	T	1.8
Rocky/Ursus Coves	0	20.2	8.5	71.1	49.9	0	0.3	0	0	0
Iniskin/Cottonwood	0.1	0.4	0.4	0.2	1.3	0	T	0	0	0
Miscellaneous	1.6	16.8	18.5	6.5	6.3	13.8	60.6	45.0	0	39.6
Total	889.7	551.6	700.6	1,408.3	921.3	383.7	479.8	1,647.9	451.5	1,457.8

-continued-

Appendix A20.–Page 2 of 2.

Location	2000	2002	2004
Humpy Creek	0	0	0
Halibut Cove & Lagoon	0.5	0.3	T
China Poot[a]	4.0	4.7	1.5
Tutka/Barabara	1,055.4	709.0	1,176.8
Seldovia Bay	10.2	1.3	0.1
Port Graham Bay	0	238.7	1,283.5
Dogfish Bay	0	0	0
Port Chatham	0	0	0
Windy Bay	0	0	0
Rocky Bay	0	0	0
Port Dick Bay	306.6	454.1	41.6
Nuka Island	0	0.0	0
E. Nuka Bay	0.3	115.9	1.1
Resurrection Bay	0.4	0	0
Bruin Bay	5.5	333.7	1.5
Rocky/Ursus Coves	0	110.1	4.5
Iniskin/Cottonwood Bays	0	0.1	6.4
Miscellaneous	4.4	2.2	0.6
Total	1,387.3	1,970.1	2,517.5

Source: ADF&G fish ticket database *Unpublished*.

Note: "T" denotes trace, less than 50 fish harvested

[a] China Poot Subdistrict, which includes China Poot, Neptune, and Peterson Bays, was part of Halibut Cove Subdistrict prior to 1988.

Appendix A21.–Commercial chum salmon catch in numbers of fish by district, Lower Cook Inlet, 1985–2005.

Year	Southern	Outer	Kamishak	Eastern	Total
1985	5,513	11,844	8,139	5,144	30,640
1986	5,560	11,701	61,670	3,757	82,688
1987	5,030	28,663	108,412	14,913	157,018
1988	7,742	71,202	218,299	24,668	321,911
1989	3,141	43	7,809	312	11,305
1990	2,433	614	3,597	307	6,951
1991	1,962	14,337	7,853	80	24,232
1992	1,885	181	20,051	86	22,203
1993	2,788	970	600	9	4,367
1994	2,631	32	14	2,792	5,469
1995	4,530	474	10,302	330	15,636
1996	3,511	3	27	223	3,764
1997	4,260	1,575	7	66	5,908
1998	3,956	611	29	51	4,647
1999	4,624	2,062	23	1,232	7,941
2000	5,340	302	66,072	1,540	73,254
2001	3,789	408	84,766	6	88,969
2002	4,803	3,810	34,641	5	43,259
2003	5,730	137	29,800	19	35,686
2004	1,372[a]	27,911	177,395	1	206,679
2005	1,750[a]	12,524	83,943	385	98,602
20-Year Avg.	4,030	8,844	41,975	2,777	57,627
1985-1994 Avg.	3,869	13,959	43,644	5,207	66,678
1995-2004 Avg.	4,192	3,729	40,306	347	48,575
2005 % of Total	1.77%	12.70%	85.13%	0.39%	100.00%

Source: ADF&G fish ticket database *Unpublished*.

[a] 2004 and 2005 totals do not include a very small number of fish retained for personal use.

Appendix A22.–Commercial chum salmon catch in thousands of fish by subdistrict, Lower Cook Inlet, 1959–2005**.**

Location	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
Tutka Bay	0.1	2.4	1.8	2.9	2.4	5.6	1.1	3.9	4.0	1.3	0.7	1.6	0.5
Port Graham	2.3	1.8	0.5	4.0	3.8	2.1	0.9	5.3	3.0	2.3	1.3	4.8	2.0
Dogfish Bay	4.9	0.4	0.1	0	0.2	0	0	7.0	15.3	0.1	0	50.9	114.5
Port Chatham	1.0	2.5	0	2.8	4.3	5.2	0	17.8	0	1.0	0	0.1	2.4
Rocky/Windy Bays	14.9	6.4	2.2	8.5	0.3	33.8	8.1	1.7	0	0.5	0	39.4	1.4
Port Dick	42.4	51.0	36.8	112.0	110.8	227.4	14.2	60.9	36.0	10.9	5.4	41.2	0.7
Nuka Bay	1.7	8.4	1.7	0.5	1.5	0	0	0	1.5	6.9	0	5.9	0.1
Resurrection Bay	0.1	0.5	0	0	0	0	0	0	0.1	0.7	0	0.6	0.4
Douglas River	0.2	0	0	0	0	0	0	0	0	0	0	0	0
Kamishak River	0	0	0	0	0	0	0	0	0	3.7	0.4	0	0
McNeil River	0	0.4	0	0	0	2.7	0.9	0	0.4	8.3	4.4	1.9	0
Bruin Bay	0	0.3	0.5	0	0.1	0	0.4	0	1.0	7.5	0	12.8	1.6
Ursus/Rocky Coves	8.5	8.6	1.8	1.1	2.8	1.2	0	4.0	2.9	1.0	3.6	8.9	10.3
Cottonwood/Iniskin	12.1	33.4	10.2	41.7	10.9	38.4	0	0	19.0	25.5	44.4	71.9	14.5
Miscellaneous	22.6	0	0	5.8	1.4	6.9	2.5	28.5	2.2	5.4	1.0	2.4	0.2
Totals	110.8	116.1	55.6	179.3	138.5	323.3	28.1	129.1	85.4	75.1	61.2	242.4	148.6

Location	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
Tutka Bay	1.3	0.8	1.4	2.0	0.9	0.8	2.6	2.7	1.8	7.9	8.3	9.9	3.4
Port Graham	3.2	2.6	1.0	2.2	0.5	5.0	2.4	4.3	2.5	11.2	7.4	1.7	3.6
Dogfish Bay	41.1	0.4	0	0	0	9.4	0	8.5	2.1	71.8	15.6	2.8	1.1
Port Chatham	0	0.4	0	0.6	0	0.1	0	1.7	1.3	59.5	14.1	2.1	0
Rocky/Windy Bays	0	0.9	0	0.3	0	17.7	0	76.7	2.1	7.4	0	3.2	0
Port Dick	0	33.4	8.1	6.8	0	25.6	10.3	79.0	19.0	95.8	32.5	18.0	1.9
Nuka Bay	2.3	40.8	3.9	3.6	0.4	17.4	0.4	14.7	7.8	3.8	0.9	0.8	0.2
Resurrection Bay	0.7	0	0	0	0	0	0.1	0	0.7	2.4	7.7	6.9	3.0
Douglas River	0	0	0	0.1	7.1	4.0	2.9	0.7	10.0	46.7	37.1	27.2	9.2
Kamishak River	2.4	0	1.8	0	10.5	0	23.9	17.8	2.8	8.6	9.2	23.9	16.2
McNeil River	2.3	0	2.0	0	16.9	38.5	4.9	6.5	6.3	11.6	32.6	67.9	12.0
Bruin Bay	1.8	0	0.7	0	0	0	0	4.0	11.0	1.7	1.3	2.6	5.9
Ursus/Rocky Coves	0.2	5.7	0	2.0	2.8	7.8	1.9	0.5	0.3	1.5	7.2	0	3.7
Cottonwood/Iniskin	19.7	29.9	0	2.8	11.5	15.3	14.9	0.2	5.4	3.5	21.6	21.4	23.0
Miscellaneous	0.5	0.6	0.3	1.2	0.2	4.2	9.2	1.2	0.4	2.7	2.5	3.9	9.3
Totals	75.5	115.5	19.2	21.6	50.8	145.8	73.5	218.5	73.5	336.1	198.0	192.3	92.5

Location	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Tutka Bay	3.2	3.9	3.9	4.7	2.5	1.5	0.8	0.6	0.9	0.8	1.6	1.0	1.1
Port Graham	1.3	0.8	0.4	1.2	0	0	0	0	0	0	0.7	0.7	2.0
Dogfish Bay	0	0	0	0	0	0	0	0	0	0	0	0	0
Port Chatham	1.3	0	0	0	0	0.1	0.1	0	0.1	0	T	0	0
Rocky/Windy Bays	0	0	0	0	0	0	0.5	0	0.1	0	0.4	0	1.6
Port Dick	9.6	10.4	27.1	64.4	0	0.5	13.7	0.2	0.7	T	0	0	0
Nuka Bay	0.8	1.3	1.6	6.8	0	T	T	0	T	T	0.1	T	T
Resurrection Bay	3.0	3.5	13.9	23.9	0	0	0	0	0	2.5	0.3	0.2	0
Douglas River	8.0	11.6	23.7	24.8	0	0.1	3.0	12.5	T	T	0.7	0	0
Kamishak River	0.1	0.1	24.6	26.7	0	T	0.7	1.5	0	0	0.1	0	0
McNeil River	0	13.7	32.9	104.0	0.1	0.1	0.1	2.0	0.4	0	0	0	T
Bruin Bay	0	5.4	0.1	2.8	4.4	1.6	2.6	0.8	T	0	4.9	T	T
Ursus/Rocky Coves	0	22.1	17.2	20.7	3.4	0	0	2.7	0	0	2.2	0	0
Cottonwood/Iniskin	0	8.8	9.7	39.2	0	0	1.0	0.2	0	0	2.3	0	0
Miscellaneous	3.3	1.1	1.9	2.7	0.9	3.0	1.7	1.6	2.1	2.1	2.3	1.9	1.2
Totals	30.6	82.7	157.0	321.9	11.3	7.0	24.2	22.2	4.4	5.5	15.6	3.8	5.9

-continued-

Appendix A22.–Page 2 of 2.

Location	1998	1999	2000	2001	2002	2003	2004	2005
Tutka Bay	0.9	1.5	1.8	1.4	2.7	2.6	0.7	0.8
Port Graham	0.8	0	T	0	0.4	0.1	0.2	0
Dogfish Bay	0	0	0	0	0	0	0	0
Port Chatham	0.1	0	0	0	0	0	0	0
Rocky/Windy Bays	0.3	0	0	0.3	0	0.1	0	5.6
Port Dick	0.1	0	0.1	0.1	3.8	T	27.8	5.3
Nuka Bay	T	2.1	0.2	T	0.1	T	0.1	0
Resurrection Bay	0	0	1.5	T	T	T	T	0.1
Douglas River	0	0	19.9	10.3	7.0	T	6.7	2.8
Kamishak River	0	0	43.7	73.0	5.1	0	0	0
McNeil River	0	0	0	T	0	0	0	0
Bruin Bay	T	T	2.4	0	2.0	0.1	7.0	7.0
Ursus/Rocky Coves	0	0	0	1.5	3.4	0	1.8	0
Cottonwood/Iniskin	0	0	0	0	17.0	29.7	161.9	74.1
Miscellaneous	2.3	4.4	3.6	2.4	1.8	3.1	0.5	2.9
Totals	4.6	7.9	73.3	89.0	43.3	35.7	206.7	98.6

Source: ADF&G fish ticket database *Unpublished*.

Note: "T" denotes trace, less than 50 fish harvested.

Appendix A23.–Estimated sockeye salmon escapements in thousands of fish for the major spawning systems of Lower Cook Inlet, 1985–2005.

Year	English Bay Lake	Delight Lake	Desire Lake	Delusion Lake	Bear Lake[a,b]	Aialik Lake	Mikfik Lake	Chenik Lake	Amakdedori Creek	Kamishak Rivers	Total
1985	5.0	26.0	18.0	no data	1.1	8.0	20.0	3.5	0.9	0.8	83.3
1986	2.8	13.0	10.0	no data	0.8	7.6	7.8	7.0	1.9	5.0	55.9
1987	7.0	10.5	13.4	no data	0.3	9.2	9.0	10.0	1.1	[c]	60.5
1988	2.5	1.2	9.0	no data	0.1	13.0	10.1	9.0	0.4	0.5	45.8
1989	4.5	7.7	9.0	2.0	0.1	6.5	11.5	12.0[b]	1.2	0.5	55.0
1990	3.3	5.2	9.5	0.3	0.1	5.7	8.8	17.0	1.8	0.2	51.9
1991	7.0	4.1	8.2	0.3	0.7	3.7	9.7	10.2[b]	1.9	0.7	46.5
1992	6.4	5.9	11.9	1.0	1.9	2.5	7.8	9.3[b]	1.9	4.9	53.5
1993	8.9	5.6	11.0	1.3	5.0	3.0	6.4	4.0[b]	2.0	4.1	51.3
1994	13.8[b]	5.6	10.5	1.3	8.6	7.3	9.5	0.8[b]	0.8	[c]	58.2
1995	22.5[b]	15.8	15.8	1.5	8.3	2.6	10.1	1.1[b]	2.4	[c]	80.1
1996	12.4[b]	7.7	9.4	0.7	8.0	3.5	10.5	3.0[b]	2.9	1.8	55.9
1997	15.4[b]	27.8[b]	14.7[b]	1.4	7.9	11.4	8.5	2.3[b]	1.5	[c]	90.9
1998	15.4[b]	9.2[b]	7.9	1.1	8.4	4.9	12.6	1.9	4.1	[c]	64.2
1999	15.8[b]	17.0[d]	14.6	1.1	7.8	3.8	15.7	2.9	8.8	2.2	89.7
2000	12.6[b]	12.3	4.0	2.1	11.9	4.3	10.9	4.8	3.3	1.5	67.7
2001	10.5[b]	10.1	5.5	2.8	12.8	5.1	5.4	0.3	2.7	2.5	57.7
2002	16.9[b]	19.6[b]	16.0	3.6	12.5	6.1	16.7	4.7	3.2	3.3	102.6
2003	20.0[b]	7.5[e]	8.4	2.0	13.2	5.4	12.8	13.8	11.8	2.6	97.5
2004	16.7[b]	7.3[e]	10.7	1.0	11.9	10.1	14.0	17.0	7.2	0.8	96.7
2005	8.2[b]	15.2[e]	4.8	1.1	13.4	5.3	6.0	14.5[d]	1.7	3.9	74.1
20-year Average	10.9	11.0	10.9	1.5	6.1	6.2	10.7	6.7	3.1	2.1	69.1
1985-1994 Average	6.1	8.5	11.1	1.0	1.9	6.7	10.1	8.3	1.4	2.1	57.0
1995-2004 Average	15.7	13.4	10.7	1.7	10.3	5.7	11.3	5.2	4.8	2.1	80.9
Sustainable Esc. Goal[f]	6.0 –13.5	5.95 –12.55	8.8 –15.2	[g]	0.7 –8.3	3.7 –8.0	6.3 –12.15	1.88 –9.3	1.25 –2.6	[g]	34.58 –81.6

Note: Unless otherwise noted, estimated escapements are either peak aerial survey counts or adjusted aerial survey counts based on survey conditions and time of surveys.

[a] Escapement limited by Bear Lake Management Plan since 1971.

[b] Weir counts.

[c] Insufficient survey data to generate escapement estimate.

[d] Combination of weir and video counts.

[e] Combination of weir and aerial counts.

[f] New sustainable escapement goals (SEGs) implemented for the first time beginning with the 2002 season.

[g] No formal escapement goal established.

Appendix A24.–Estimated pink salmon escapements in thousands of fish for the major spawning systems of Lower Cook Inlet, 1960–2005.

	YEAR										
Location	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
Humpy Creek	10.0	22.6	56.0	34.7	18.5	28.0	30.0	25.0	24.7	5.4	55.2
China Poot Creek	9.0	2.0	26.0	---	---	---	---	2.5	6.0	0.2	1.5
Tutka Lagoon Creek	15.0	15.0	30.0	10.0	20.0	20.0	12.0	7.0	7.9	6.5	6.5
Barabara Creek	2.0	0.1	1.5	0.1	---	---	5.0	---	2.0	0.9	0.4
Seldovia River	25.0	25.0	50.0	13.0	60.0	30.0	86.0	55.0	53.2	60.0	23.0
Port Graham River	15.0	5.0	50.0	2.0	16.0	1.5	24.0	2.0	24.4	4.0	16.6
Dogfish Lagoon	2.0	---	3.0	---	---	---	---	---	---	---	---
Port Chatham Creeks	4.0	7.0	7.0	---	---	---	10.0	---	---	---	3.0
Windy Right Creek	8.0	10.0	12.5	4.9	6.2	2.0	7.0	6.0	2.8	3.2	2.1
Windy Left Creek	8.0	5.0	12.5	4.5	7.7	10.0	7.0	6.0	6.9	23.0	13.0
Rocky River	130.0	2.0	200.0	12.0	80.0	0.3	44.0	1.0	43.1	1.0	32.0
Port Dick Creek[a]	35.0	14.0	40.0	16.0	31.5	50.0	35.0	20.0	29.0	12.0	34.5
Island Creek	23.2	2.0	15.0	3.6	30.0	0.5	7.0	0.5	4.3	0.1	5.5
South Nuka Island Creek	20.0	2.0	22.0	0.1	10.0	---	10.0	---	10.0	3.0	11.0
Desire Lake Creek	---	---	18.0	---	1.3	---	---	---	---	---	---
James Lagoon	---	---	---	---	---	---	---	---	---	---	---
Aialik Lagoon	---	---	25.0	0.3	---	---	2.0	---	---	---	---
Bear Creek	1.4	---	3.1	---	6.4	---	---	---	3.1	---	---
Salmon Creek	---	---	---	---	---	---	---	---	---	---	---
Thumb Cove	---	---	---	---	---	---	---	---	---	---	---
Humpy Cove	---	---	---	---	---	---	---	---	---	---	---
Tonsina Creek	---	---	---	---	---	---		---	2.9	0.1	---
Big Kamishak River	---	---	100.0	75.0	75.0	---	13.0	---	---	---	---
Little Kamishak River	---	---	100.0	24.0	---	---	28.0	3.5	---	0.5	2.0
Amakdedori Creek	60.0	---	80.0	---	10.0	---	8.0	---	---	1.0	13.0
Bruin Bay River	18.0	---	300.0	25.0	---	---	20.0	0.5	---	5.0	40.0
Sunday Creek	1.5	---	5.0	2.0	---	---	20.0	---	---	1.0	2.0
Brown's Peak Creek	---	---	25.0	10.0	20.0	10.0	11.0	---	---	2.0	---
Totals	387.1	111.7	1,181.6	237.2	392.6	152.3	379.0	129.0	220.3	128.9	261.3

-continued-

Appendix A24.–Page 2 of 5.

Location	YEAR										
	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
Humpy Creek	45.0	13.8	36.9	17.4	64.0	27.2	86.0	46.1	200.0	64.4	115.0
China Poot Creek	2.1	1.0	6.0	5.2	21.6	2.0	3.9	11.2	20.6	12.3	5.0
Tutka Lagoon Creek	16.7	1.5	6.5	2.6	17.6	11.5	14.0	15.0	10.6	17.3	21.1
Barabara Creek	4.0	0.6	---	0.2	22.7	0.2	5.7	1.4	10.0	5.8	16.8
Seldovia River	31.1	5.8	14.5	13.7	36.2	25.6	35.7	24.6	43.7	65.5	62.7
Port Graham River	13.2	2.4	7.0	2.8	27.3	6.5	20.6	6.7	32.7	40.2	18.4
Dogfish Lagoon	0.3	---	1.0	---	2.3	---	8.1	0.6	7.3	0.3	2.6
Port Chatham Creeks	15.5	1.0	5.0	0.2	7.7	---	14.2	0.3	20.8	7.7	11.2
Windy Right Creek	13.0	0.1	4.6	0.1	18.7	0.2	11.1	0.3	10.4	3.3	4.7
Windy Left Creek	35.4	0.4	12.9	0.1	9.7	0.2	47.3	1.1	74.8	10.9	31.3
Rocky River	1.6	8.2	2.0	1.5	4.4	2.7	36.7	8.2	85.0	6.4	25.0
Port Dick Creek[a]	97.8	10.0	26.4	1.5	62.8	12.7	109.3	44.9	116.0	56.1	106.0
Island Creek	0.1	1.7	0.5	0.5	0.1	---	0.6	0.4	0.6	2.2	25.0
South Nuka Island Creek	14.0	0.3	16.0	---	28.0	---	12.0	---	15.0	0.3	16.0
Desire Lake Creek	30.0	0.3	3.0	---	0.4	0.6	0.8	1.0	3.0	16.0	5.0
James Lagoon	---	---	---	---	---	---	---	---	---	4.6	14.0
Aialik Lagoon	---	---	---	0.1	---	0.4	---	---	---	---	---
Bear Creek	---	0.5	---	4.9	---	10.0	---	7.8	---	13.3	0.4
Salmon Creek	---	---	---	---	---	16.9	---	11.0	---	15.5	0.1
Thumb Cove	---	---	---	1.1	---	2.0	---	2.0	---	1.2	1.0
Humpy Cove	---	---	---	0.6	---	1.4	---	0.9	---	5.7	0.4
Tonsina Creek	---	---	---	1.4	---	5.7	---	1.5	---	0.7	0.2
Big Kamishak River	---	---	15.0	1.0	---	8.0	---	12.0	10.0	2.0	---
Little Kamishak River	---	---	13.0	---	---	6.0	---	0.4	3.5	0.6	---
Amakdedori Creek	---	0.2	3.0	1.0	5.0	---	---	0.9	6.0	3.8	1.5
Bruin Bay River	22.0	2.5	2.0	0.6	20.0	13.5	60.0	33.0	200.0	400.0	95.0
Sunday Creek	43.0	2.0	5.0	0.1	20.0	0.3	9.0	0.2	12.0	5.2	14.2
Brown's Peak Creek	8.0	1.2	3.2	0.1	10.0	1.2	13.0	0.9	15.0	2.3	17.7
Totals	392.8	53.5	183.5	56.7	378.5	154.8	488.0	232.4	897.0	763.6	610.3

-continued-

Appendix A24.–Page 3 of 5.

Location	YEAR										
	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Humpy Creek	31.9	104.0	84.2	117.0	49.7	26.6	21.4	93.0	27.0	17.4	14.9
China Poot Creek	3.1	14.1	8.4	1.9	11.5	3.1	3.9	8.5	4.2	2.6	4.1
Tutka Lagoon Creek	18.5	12.9	10.5	14.0	13.4	4.8	11.2	11.9	38.5	16.8	26.7
Barabara Creek	2.1	14.8	1.0	1.6	1.8	0.3	0.7	4.5	3.9	10.9	2.2
Seldovia River	38.4	27.9	14.2	22.8	28.2	7.6	16.9	26.2	27.8	30.0	14.7
Port Graham River	28.9	4.6	10.9	26.3	17.5	3.8	7.9	19.1	20.1	29.0	5.4
Dogfish Lagoon	2.6	1.0	0.6	0.2	0.4	1.2	0.3	0.2	7.1	9.3	[c]
Port Chatham Creeks	2.0	3.5	7.8	8.9	11.5	10.2	21.0	31.7	27.8	23.8	4.3
Windy Right Creek	4.7	4.3	3.4	5.4	2.5	2.0	1.3	6.6	7.1	20.7	3.9
Windy Left Creek	4.4	11.9	2.5	8.9	2.2	5.6	3.4	25.2	7.5	34.5	8.2
Rocky River	6.6	16.6	9.0	12.1	12.0	4.5	5.4	10.3	18.0	26.1	25.4
Port Dick Creek[a]	19.9	64.1	44.6	65.3	41.6	4.5	12.0	55.4	41.7	54.2	6.9
Island Creek	15.0	15.3	35.0	27.9	16.6	0.1	7.2	6.7	25.0	24.4	12.5
South Nuka Island Creek	0.4	22.2	0.6	3.6	7.0	2.8	1.2	7.3	13.3	16.4	6.1
Desire Lake Creek	12.0	8.5	23.0	62.5	32.0	11.0	2.5	47.0	1.0	1.3	0.4
James Lagoon	6.0	5.1	4.0	9.0	6.6	1.1	1.7	4.9	3.8	4.4	0.4
Aialik Lagoon	5.0	3.0	4.0	9.4	6.0	1.5	0.7	0.8	---	---	[d]
Bear Creek	7.9	0.8	7.7	4.1	14.0	3.5	0.2	1.7	4.4	15.4[b]	2.3
Salmon Creek	21.0	0.5	10.2	2.1	8.3	1.7	0.1	1.6	---	[b]	5.3
Thumb Cove	7.9	4.9	4.2	14.5	4.0	2.7	0.3	4.2	---	3.4	0.4
Humpy Cove	4.0	2.0	2.5	5.0	0.9	0.3	0.4	1.0	3.8	---	[c]
Tonsina Creek	7.5	5.4	6.0	48.2	11.2	3.4	0.1	0.5	1.2	0.3	[c]
Big Kamishak River	5.0	---	---	---	5.0	---	1.0	---	---	---	[c]
Little Kamishak River	2.2	---	0.1	1.6	2.0	---	0.5	---	---	0.9	[c]
Amakdedori Creek	6.3	0.2	---	1.0	6.0	0.4	1.0	2.0	0.1	0.7	3.2
Bruin Bay River	75.0	4.0	110.0	3.5	1,200.0	24.0	29.0	350.0	19.0	74.9	3.2
Sunday Creek	12.0	4.7	12.0	11.4	109.0	29.7	18.0	103.0	2.8	20.9	2.9
Brown's Peak Creek	3.5	1.7	6.8	7.0	28.0	40.2	17.0	120.0	1.0	16.7	5.0
Totals	353.8	358.0	423.2	495.2	1,648.9	196.6	186.3	943.3	306.1	455.0	158.4

-continued-

Location	YEAR										
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Humpy Creek	36.0	14.1	89.3	9.0	78.3	17.5	12.8	22.4	30.5	37.1	90.9
China Poot Creek	1.6	5.7	2.0	2.8	2.8	5.7	0.7	7.5	6.6	6.5	6.7
Tutka Lagoon Creek	27.4	14.5	15.9	3.5	45.0	17.5	27.9	19.0	4.5	15.9	30.9
Barabara Creek	11.9	4.5	10.8	2.4	12.5	2.8	3.9	5.6	2.3	3.2	5.1
Seldovia River	43.4	24.4	48.5	17.8	39.1	31.5	12.2	53.5	12.3	26.9	35.1
Port Graham River	12.8	7.6	10.0	7.0	12.5	12.6	9.7	15.6	10.3	58.5	14.9
Dogfish Lagoon	0.3	1.3	13.3	2.3	20.0	6.7	12.4	11.1	2.0	1.3	5.2
Port Chatham Creeks	22.2	3.3	14.0	8.6	42.7	22.2	10.7	16.7	17.9	18.1	35.0
Windy Right Creek	13.6	2.2	11.4	9.9	13.9	19.5	5.2	23.0	10.3	14.4	23.3
Windy Left Creek	25.9	3.0	31.6	2.5	64.6	12.9	24.0	20.1	61.8	28.9	82.8
Rocky River	70.0	17.1	56.3	80.1	48.1	165.0	17.2	131.6	73.0	112.5	287.4
Port Dick Creek[a]	37.0	18.1	6.6	23.2	36.9	59.1	8.5	124.4[d]	44.7	108.0	107.7
Island Creek	12.1	28.3	10.6	40.1	71.1	83.6	8.6	70.8	81.8	44.1	118.6
South Nuka Island Creek	34.3	1.4	6.2	6.8	9.3	14.0	2.4	13.6	20.7	14.8	41.4
Desire Lake Creek	19.3	---	---	---	6.2	6.2	6.8	21.1	67.5	78.4	34.8
James Lagoon	3.3	0.8	0.6	---	---	---	---	3.9	2.3	3.1	---
Aialik Lagoon	---	---	1.1	---	---	0.4	0.9	---	---	---	---
Bear Creek	6.6[b]	34.8[b]	38.6[b]	8.0[b]	6.3[b]	13.2[b]	7.8[b]	35.6[b]	3.0[b]	2.7[b]	4.4[b]
Salmon Creek	[b]	[b]	[b]	[b]	[b]	[b]	[b]	[b]	[b]	[b]	[b]
Thumb Cove	5.5	10.8	9.3	9.5	4.7	21.0	9.2	8.5	3.1	3.7	5.1
Humpy Cove	0.9	2.2	1.8	3.4	2.2	1.2	4.0	1.7	0.3	1.8	2.6
Tonsina Creek	3.2	7.0	0.5	0.4	0.4	2.3	0.5	6.6	2.8	6.9	5.2
Big Kamishak River	---	---	---	16.7	---	2.0	5.7	14.9	---	---	---
Little Kamishak River	---	---	---	---	---	---	4.2	13.0	---	3.4	---
Amakdedori Creek	1.7	0.7	4.5	---	1.7	---	---	---	6.0	0.9	---
Bruin Bay River	86.4	5.9	307.3	27.5	162.7	134.9	2.9	176.7	18.5	1,598.5	138.7
Sunday Creek	57.8	3.1	95.9	2.8	52.5	24.0	5.3	39.8	26.2	81.9	346.7
Brown's Peak Creek	41.6	1.3	96.7	2.4	42.3	7.9	2.6	9.8	19.2	27.5	285.0
Totals	574.8	212.1	882.8	286.7	775.8	683.7	205.9	865.0	527.6	2,299.0	1,707.5

-continued-

Appendix A24.–Page 5 of 5.

Location	YEAR 2004	YEAR 2005	1960 - 2004 Average	Sustainable Escapement Goal[e]
Humpy Creek	28.9	93.8	46.2	21.65–85.55
China Poot Creek	3.3	9.2	6.2	2.9–8.2
Tutka Lagoon Creek	17.8	133.6	15.6	11.6–18.9
Barabara Creek	5.4	14.4	4.7	1.9–9.0
Seldovia River	56.8	98.6	33.2	19.05–38.95
Port Graham River	44.0	69.1	16.2	7.0–19.85
Dogfish Lagoon	3.2	22.3	4.0	---
Port Chatham Creeks	26.4	44.4	13.3	7.8–21.0
Windy Right Creek	12.0	22.2	7.8	3.35–10.95
Windy Left Creek	23.3	72.0	18.3	3.65–29.95
Rocky River	53.8	198.7	44.1	9.35–54.25
Port Dick Creek[a]	13.3	122.2	43.5	18.55–58.3
Island Creek	33.6	26.4	20.7	7.2–28.3
South Nuka Island Creek	6.4	11.2	11.0	2.7–14.25
Desire Lake Creek	24.3	46.0	17.0	1.9–20.2
James Lagoon	---	---	4.2	---
Aialik Lagoon	---	0.8	3.8	---
Bear Creek	1.2[b]	34.5[b]	8.3	2.95–8.45
Salmon Creek	[b]	[b]	7.3	1.9–13.25
Thumb Cove	4.3	8.7	5.5	2.35–8.85
Humpy Cove	1.0	14.6	2.0	0.9–3.2
Tonsina Creek	3.5	9.9	4.7	0.5–5.85
Big Kamishak River	---	---	21.3	---
Little Kamishak River	3.0	---	10.1	---
Amakdedori Creek	---	---	7.7	---
Bruin Bay River	66.5	98.3	143.3	18.65–155.75
Sunday Creek	31.5	116.2	30.9	4.85–28.85
Brown's Peak Creek	18.1	61.0	23.8	2.45–18.8
Totals	481.6	1,328.1	507.1	153.15–660.65

Note: Escapement estimates are derived from periodic ground surveys with stream life factors applied, or from periodic aerial surveys. Aerial survey estimates after 1990 incorporate stream life factors; prior to 1990, aerial estimates are peak aerial survey counts adjusted for survey conditions and time of surveys.

[a] Escapement figures for Port Dick Creek include escapements for High Tech and Well Flagged Creeks beginning in 1998.

[b] Escapement figure for Bear Creek represents the combined escapement for Bear and Salmon Creeks.

[c] Insufficient data for escapement estimates.

[d] Port Dick Creek counts derived from aerial data in 2000. Other methods also used to generate escapement estimates that season included ground surveys (91,795) and weir counts (142,450).

[e] New sustainable escapement goals (SEGs) implemented for the first time beginning with the 2002 season.

Appendix A25.–Estimated chum salmon escapements in thousands of fish for the major spawning systems of Lower Cook Inlet, 1985–2005.

Year	Port Graham	Dogfish Lagoon	Rocky River	Pt. Dick Head	Island Creek	Big Kamishak	Little Kamishak	McNeil River	Bruin Bay	Ursus Cove	Cotton-wood	Iniskin Bay	Total
1985	0.5	4.9	2.5	1.0	9.1	6.0	4.5	9.5	2.0	3.0	3.0	5.0	51.0
1986	0.6	2.5	2.0	1.7	8.6	24.0	17.0	22.0	2.0	11.0	11.0	5.9	108.3
1987	1.5	2.0	0.2	6.1	13.2	12.0	18.0	26.0	10.0	9.9	17.0	9.1	125.0
1988	3.0	8.6	0.3	9.0	7.8	15.0	13.0	49.0	7.0	9.4	16.0	9.5	147.6
1989	1.3	1.8	1.2	3.3	4.8	30.0	12.0	34.0	8.0	6.3	8.0	5.9	116.6
1990	2.6	1.0	0.8	1.1	2.3	2.5	7.9	8.0	4.0	3.8	4.3	8.4	46.7
1991	1.1	3.1	---	7.4	17.3	8.7	8.4	10.0	6.0	1.3	7.7	8.3	79.3
1992	1.4	0.8	1.7	5.4	6.7	4.5	7.1	19.2	8.5	1.7	6.1	3.4	66.5
1993	2.5	5.4	0.1	2.5	3.6	9.1	6.3	17.4	6.0	7.7	12.0	8.0	78.8
1994	5.2	11.3	1.9	3.5	8.8	---	9.0	15.0	6.1	6.2	10.2	18.9	96.1
1995	3.8	4.2	5.1	3.3	7.7	[a]	[a]	14.4	6.6	11.1	15.4	22.7	90.9
1996	3.7	6.7	2.0	2.3	6.9	11.1	4.4	16.1	14.9	7.6	16.1	7.8	99.6
1997	4.1	12.7	1.1	1.9	5.2	---	---	27.5	8.8	6.2	5.6	15.4	88.5
1998	5.1	9.8	0.7	1.8	3.4	7.1	9.7	23.5	9.4	4.6	2.3	18.6	96.0
1999	6.6	18.8	5.4	2.9	16.4	11.6	8.9	13.5	10.3	21.0	12.0	23.3	150.7
2000	11.4	19.6	4.2	3.4	12.1	45.3	26.9	18.6	13.6	41.7	24.1	23.6	244.5
2001	6.0	6.1	3.0	1.8	6.3	36.3	27.2	17.0	21.8	37.7	15.9	13.8	192.9
2002	5.3	10.1	5.7	12.3	15.3	17.4	16.4	11.3	9.9	17.1	42.2	28.5	191.6
2003	2.9	13.3	5.5	5.6	16.3	16.4	22.2	23.3	13.1	30.4	72.8	18.7	240.5
2004	1.2	3.6	17.2	8.6	15.1	57.9	45.3	11.2	15.9	16.0	16.3	22.0	230.3
2005	0.7	2.7	6.1	4.8	20.7	25.7	12.1	17.4	21.2	12.2	17.9	16.5	158.0
20-Year Avg.	3.5	7.3	3.2	4.2	9.3	18.5	14.7	19.3	9.2	12.7	15.9	13.8	131.7
1985-1994 Avg.	2.0	4.1	1.2	4.1	8.2	12.4	10.3	21.0	6.0	6.0	9.5	8.2	93.1
1995-04 Avg.	5.0	10.5	5.0	4.4	10.5	25.4	20.1	17.6	12.4	19.3	22.3	19.4	172.0
Sustainable Esc. Goal[b]	1.45–4.8	3.35–9.15	1.2–5.4	1.9–4.45	6.4–15.6	9.35–24.0	6.55–23.8	13.75–25.75	6.0 –10.25	6.05–9.85	5.75–12.0	7.85– 13.7	69.6 –158.75

Note: Escapement estimates are derived from periodic ground surveys with stream life factors applied, or from periodic aerial surveys. Aerial survey estimates after 1990 incorporate stream life factors; prior to 1990, aerial estimates are peak aerial survey counts adjusted for survey conditions and time of surveys.

[a] Insufficient data to generate escapement estimates.

[b] New sustainable escapement goals (SEGs) implemented for the first time beginning with the 2002 season.

Appendix A26.–Biological escapement goals (BEGs) prior to 2002 and sustainable escapement goals (SEGs) beginning in 2002 for chum salmon systems in Lower Cook Inlet, Alaska.

Chum Salmon

		Former BEG			New SEG				% Change
System	District	BEG	Midpoint	Year Adopted	Low	High	Range Midpoint	n[a]	In Midpoint
Port Graham River	Southern	4,000–8,000	6,000	1982	1,450	4,800	3,125	26	-48%
Dogfish Lagoon	Outer	5,000–10,000	7,500	1982	3,350	9,150	6,250	26	-17%
Rocky River	Outer	20,000	20,000	1982	1,200	5,400	3,300	25	-84%
Port Dick Creek	Outer	4,000	4,000	1982	1,900	4,450	3,175	26	-26%
Island Creek	Outer	10,000–15,000	12,500	1979	6,400	15,600	11,000	26	-12%
Big Kamishak River	Kamishak	20,000	20,000	1982	9,350	24,000	16,675	22	-17%
Little Kamishak River	Kamishak	20,000	20,000	1982	6,550	23,800	15,175	23	-24%
McNeil River	Kamishak	20,000–40,000	30,000	1988	13,750	25,750	19,750	26	-34%
Bruin River	Kamishak	5,000–10,000	7,500	1988	6,000	10,250	8,125	26	8%
Ursus Cove	Kamishak	5,000–10,000	7,500	1982	6,050	9,850	7,950	26	6%
Cottonwood Creek	Kamishak	10,000	10,000	1982	5,750	12,000	8,875	26	-11%
Iniskin Bay	Kamishak	10,000	10,000	1982	7,850	13,750	10,775	26	8%
								Mean	-20%

[a] n = number of years of escapement data used in analysis.

Appendix A27.–Biological escapement goals (BEGs) prior to 2002 and sustainable escapement goals (SEGs) beginning in 2002 for pink salmon systems in Lower Cook Inlet, Alaska.

Pink Salmon

		Former BEG			New SEG				
System	District	BEG	Midpoint	Year Adopted	Low	High	Range Midpoint	n[a]	% Change In Midpoint
Humpy Creek	Southern	25,000–50,000	37,500	1982	21,650	85,550	53,600	26	43%
China Poot Creek	Southern	5,000	5,000	1982	2,900	8,200	5,550	26	11%
Tutka Creek	Southern	6,000–10,000	8,000	1982	6,500	17,000	11,700	16	46%
Barabara Creek	Southern	18,000–24,000	21,000	1982	1,900	9,000	5,450	26	-74%
Seldovia Creek	Southern	25,000–35,000	30,000	1982	19,050	38,950	29,000	26	-3%
Port Graham River	Southern	20,000–40,000	30,000	1977	7,000	19,850	13,425	26	-55%
Port Chatham	Outer	10,000–15,000	12,500	1982	7,800	21,000	14,400	25	15%
Windy Creek Right	Outer	10,000	10,000	1982	3,350	10,950	7,150	26	-29%
Windy Creek Left	Outer	30,000–50,000	40,000	1982	3,650	29,950	16,800	26	-58%
Rocky River	Outer	50,000	50,000	1982	9,350	54,250	31,800	26	-36%
Port Dick Creek	Outer	20,000–100,000	60,000	1982	18,550	58,300	38,425	26	-36%
Island Creek	Outer	12,000–18,000	15,000	1982	7,200	28,300	17,750	25	18%
S. Nuka Island Creek	Outer	10,000	10,000	1982	2,700	14,250	8,475	24	-15%
Desire Lake	Outer	10,000–20,000	15,000	1986	1,900	20,200	11,050	23	-26%
Bear Creek	Eastern	5,000	5,000	1982	[b]	[b]	[b]	27	[b]
Salmon Creek	Eastern	10,000	10,000	1981	[b]	[b]	[b]	26	[b]
Thumb Cove	Eastern	4,000	4,000	1985	2,350	8,850	5,600	23	40%
Humpy Cove	Eastern	2,000	2,000	1985	900	3,200	2,050	22	3%
Tonsina Creek	Eastern	5,000	5,000	1982	500	5,850	3,175	23	-37%
Big Kamishak River	Kamishak	20,000	20,000	1982	[c]	[c]	[c]		[c]
Little Kamishak River	Kamishak	20,000	20,000	1982	[c]	[c]	[c]		[c]
Bruin River	Kamishak	25,000–50,000	37,500	1982	18,650	155,750	87,200	26	133%
Sunday Creek	Kamishak	10,000–20,000	15,000	1989	4,850	28,850	16,850	26	12%
Brown's Peak Creek	Kamishak	10,000–20,000	15,000	1989	2,450	18,800	10,625	26	-29%
								Mean	-10%

[a] n = number of years of escapement data used in analysis

[b] Based on BOF actions in November 2004, the SEGs for Bear and Salmon Creeks were combined to form a new SEG range of 5,000 to 23,500 pink salmon and a new mid-point of 14,250.

[c] Based on BOF actions in November 2004, the pink salmon SEGs for Big and Little Kamishak Rivers were removed.

Appendix A28.–Biological escapement goals (BEGs) prior to 2002 and sustainable escapement goals (SEGs) beginning in 2002 for sockeye salmon systems in Lower Cook Inlet, Alaska.

Sockeye Salmon									
		Former BEG			New SEG				% Change in Midpoint
System	District	BEG	Midpoint	Year Adopted	Low	High	Range Mid-point	n[a]	
English Bay	Southern	10,000 - 20,000	15,000	1982	6,000	- 13,500	9,750	25	-35%
Delight Lake	Outer	10,000	10,000	1982	5,950	- 12,550	9,250	26	-8%
Desire Lake	Outer	10,000	10,000	1982	8,800	- 15,200	12,000	26	20%
Bear Lake	Eastern	5,000 - 8,000	6,500	1985	700	- 8,300	4,500	23	-31%
Aialik Lake	Eastern	2,000 - 5,000	3,500	1982	3,700	- 8,000	5,850	26	67%
Mikfik Lake	Kamishak	5,000 - 7,000	6,000	1988	6,300	- 12,150	9,225	26	54%
Chenik Lake	Kamishak	10,000	10,000	1990	1,880	- 9,300	5,590	25	-44%
Amakdedori Creek	Kamishak	1,000	1,000	1984	1,250	- 2,600	1,925	26	93%
									Mean: 15%

[a] n = number of years of escapement data used in analysis.

Appendix A29.–Personal use/subsistence set gillnet salmon catches, in numbers of fish by species, and effort, Southern District, Lower Cook Inlet, 1969–2005.

Year	Permits Issued	Permits Returned		Permits		Harvest by Species						
		Number	%	Did Fish	Not Fished	Chinook	Sockeye	Coho	Pink	Chum	Other	Total
1969	47	44	93.6	35	9	0	9	752	38	0	17	816
1970	78	73	93.6	55	18	0	12	1,179	143	13	39	1,386
1971	112	95	84.8	53	42	2	16	1,549	44	7	20	1,638
1972	135	105	77.8	64	41	1	11	975	48	69	19	1,123
1973	143	128	89.5	82	46	0	18	1,304	84	40	9	1,455
1974	148	118	79.7	52	66	0	16	376	43	77	27	539
1975	292	276	94.5	221	55	4	47	1,960	632	61	95	2,799
1976	242	221	91.3	138	83	16	46	1,962	1,513	56	75	3,668
1977	197	179	90.9	137	42	12	46	2,216	639	119	84	3,116
1978	311	264	84.9	151	113	4	35	2,482	595	34	89	3,239
1979	437	401	91.8	238	163	6	37	2,118	2,251	41	130	4,583
1980	533	494	92.7	299	195	43	32	3,491	1,021	25	153[a]	4,765
1981	384	374	97.4	274	100	25	64	4,314	732	89	100	5,324
1982	395	378	95.7	307	71	39	46	7,303	955	123	8	8,474
1983	360	328	91.1	210	118	4	21	2,525	330	40	2	2,922
1984	390	346	88.7	219	127	4	25	3,666	821	87	25	4,628
1985	316	302	95.6	205	97	5	43	3,372	166	35	3	3,624
1986	338	310	91.7	247	63	7	68	3,831	3,132	56	0	7,094
1987	361	338	93.6	249	89	5	50	3,977	279	61	0	4,372
1988	438	404	92.2	287	117	14	60	4,877	1,422	75	0	6,448
1989	466	452	97.0	332	120	41	156	7,215	882	53	49	8,396
1990	578	543	93.9	420	123	12	200	8,323	1,846	69	0	10,450
1991	472	459	97.2	295	164	8	47	4,931	366	23	0	5,375
1992	365	350	95.9	239	111	5	63	2,277	643	21	0	3,009
1993	326	317	97.2	215	102	6	44	1,992	463	18	0	2,523
1994	286	284	99.3	224	60	66	80	4,097	1,178	18	0	5,439
1995	235	232	98.7	178	54	118	108	2,916	343	7	0	3,492
1996	299	293	98.0	213	80	302	102	3,347	1,022	24	0	4,797
1997	276	264	95.7	185	79	383	191	1,814	252	12	0	2,652
1998	227	214	94.3	142	72	135	20	1,461	167	5	0	1,788
1999	146	141	96.6	111	30	276	119	1,803	168	3	0	2,369
2000	213	206	96.7	151	55	104	28	2,064	304	4	0	2,504
2001	154	148	96.1	112	34	86	27	1,579	150	16	0	1,858
2002	122	113	92.6	93	20	61	33	1,521	251	12	0	1,878
2003	104	96	92.3	72	24	17	57	1,071	170	9	0	1,324
2004	91	82	90.1	64	18	7	56	1,554	172	16	0	1,805
2005	108	96	88.9	69	27	8	57	833	296	13	0	1,207
69-04 Avg.	279	261	93.6	183	78	50	57	2,850	645	40	23	3,666
95-04 Avg.	187	179	95.8	132	47	149	74	1,913	300	11	0	2,448

Note: Figures after 1991 include information from both returned permits and inseason oral reports.

[a] Steelhead trout *Oncorhynchus mykiss*.

Appendix A30.–Summary of personal use/subsistence salmon gillnet fishermen in the Southern District of Lower Cook Inlet (excluding the Port Graham/Nanwalek subsistence fishery and the Seldovia subsistence fishery) by area of residence, 1985–2005.

Year	Homer/ Fritz Cr.		Anchorage Area[a]		Halibut Cove		Anchor Pt./ Ninilchik		Seldovia		Pt. Graham/ Nanwalek		Kenai/ Soldotna		Other		Total Permits Issued
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	
1985	251	79.4	15	4.7	6	1.9	33	10.4	6	1.9	0	0.0	2	0.6	3	0.9	316
1986	280	82.8	18	5.3	4	1.2	29	8.6	1	0.3	0	0.0	1	0.3	5	1.5	338
1987	284	78.7	25	6.9	3	0.8	37	10.2	7	1.9	0	0.0	2	0.6	3	0.8	361
1988	338	77.2	36	8.2	5	1.1	43	9.8	6	1.4	0	0.0	10	2.3	0	0.0	438
1989	348	74.7	36	7.7	5	1.1	51	10.9	8	1.7	0	0.0	6	1.3	12	2.6	466
1990	441	76.3	36	6.2	5	0.9	65	11.2	12	2.1	0	0.0	6	1.0	13	2.2	578
1991	384	81.4	27	5.7	8	1.7	41	8.7	6	1.3	0	0.0	4	0.8	2	0.4	472
1992	302	82.7	21	5.8	5	1.4	32	8.8	3	0.8	0	0.0	1	0.3	1	0.3	365
1993	242	74.2	25	7.7	5	1.5	44	13.5	3	0.9	0	0.0	5	1.5	2	0.6	326
1994	235	82.2	20	7.0	4	1.4	21	7.3	1	0.3	0	0.0	1	0.3	4	1.4	286
1995	191	81.3	15	6.4	7	3.0	20	8.5	1	0.4	0	0.0	0	0.0	1	0.4	235
1996	241	80.6	16	5.4	7	2.3	26	8.7	3	1.0	1	0.3	2	0.7	3	1.0	299
1997	232	84.1	13	4.7	3	1.1	20	7.2	4	1.4	0	0.0	1	0.4	3	1.1	276
1998	175	77.1	18	7.9	2	0.9	24	10.6	5	2.2	0	0.0	2	0.9	1	0.4	227
1999	96	65.8	18	12.3	1	0.7	23	15.8	3	2.1	0	0.0	4	2.7	1	0.7	146
2000	168	78.9	15	7.0	2	0.9	21	9.9	4	1.9	0	0.0	1	0.5	2	0.9	213
2001	109	70.8	10	6.5	3	1.9	20	13.0	5	3.2	0	0.0	4	2.6	3	1.9	154
2002	85	69.7	7	5.7	3	2.5	14	11.5	6	4.9	0	0.0	6	4.9	1	0.8	122
2003	74	71.2	9	8.7	2	1.9	11	10.6	4	3.8	0	0.0	4	3.8	0	0.0	104
2004	70	76.9	9	9.9	2	2.2	7	7.7	2	2.2	0	0.0	1	1.1	0	0.0	91
2005	80	74.1	12	11.1	2	1.9	8	7.4	1	0.9	0	0.0	3	2.8	2	1.9	108
20-Year Avg.	227	78.2	19	6.7	4	1.4	29	10.0	5	1.5	0	0.0	3	1.1	3	1.0	291
1985-94 Avg.	311	78.7	26	6.6	5	1.3	40	10.0	5	1.3	0	0.0	4	1.0	5	1.1	395
1995-04 Avg.	144	77.2	13	7.0	3	1.7	19	10.0	4	2.0	0	0.1	2	1.3	2	0.8	187

[a] After 1989, "Anchorage Area" includes Mat-Su Valley, Eagle River, Chugiak, and/or Fort Richardson.

Appendix A31.–Subsistence and sport salmon catch in numbers of fish by species for the village of Port Graham, Lower Cook Inlet, 1985–2005.

Year	Salmon Harvest						Dolly Varden	Households Reporting
	Chinook	Sockeye	Coho	Pink	Chum	Total		
1985	141	481	91	32	24	769	0	23
1986	123	274	179	237	13	826	12	27
1987	20	219	575	230	70	1,114	20	33
1988	96	411	459	542	75	1,583	18	27
1989	51	94	460	640	58	1,303	159	20
1990	211	524	803	1,013	102	2,653	666	32
1991	155	58	541	1,494	185	2,433	257	33
1992	129	98	475	745	178	1,625	398	36
1993	253	154	346	997	135	1,885	214	31
1994	273	260	859	866	461	2,719	1,133	42
1995	486	379	369	786	376	2,396	66	49[a]
1996	255	684	341	312	251	1,843	161	48
1997	202	324	203	497	152	1,378	57	25
1998	164	271	243	459	240	1,377	20	16
1999	383	360	427	150	214	1,534	64	21
2000	241	784	252	355	483	2,115		35
2001	104	176	57	20	32	389		15
2002	250	417	90	150	74	981		23
2003	321	1,991	425	266	150	3,153	87	16
2004	283	572	514	363	130	1,862		50[b]
2005[c]	[c]	[c]	[c]	[c]	[c]	[c]	[c]	[c]
1985-2004 Average	207	428	385	508	170	1,698	208	30

Source: ADF&G, Division of Subsistence, data files; gear types include set gillnet, rod/reel, and handline.

[a] Salmon totals and permits include 3 reports from non-residents of Port Graham Village.

[b] ADF&G Division of Subsistence estimate.

[c] Harvest figures for 2005 unavailable.

Appendix A32.–Subsistence and sport salmon catch in numbers of fish by species for the village of Nanwalek (formerly English Bay), Lower Cook Inlet, 1985–2005.

Year	Salmon Harvest						Dolly Varden	Households Reporting
	Chinook	Sockeye	Coho	Pink	Chum	Total		
1985	5	696	530	313	2	1,546	0	1
1986	2	373	302	825	1	1,503	144	17
1987	1	682	339	484	44	1,550	20	22
1988	8	610	385	1,214	35	2,252	70	21
1989	0	63	695	855	16	1,629	523	24
1990	54	638	614	1,947	49	3,302	2,833	28
1991	8	630	1,512	3,093	36	5,279	848	30
1992	71	437	675	676	58	1,917	1,331	35
1993	24	994	567	1666	122	3,373	577	25
1994	27	570	511	1113	43	2,264	473	28
1995	99	1,416	169	487	0	2,171	465	38
1996	55	1,060	598	437	25	2,175	221	27
1997	0	1	0	14	1	16	0	1
1998	5	18	0	0	0	23	31	3
1999	102	2,755	1,320	1,873	890	6,940	631	32
2000	18	3,880	1,579	1,251	471	7,199		32
2001	29	909	1,238	1,434	196	3,806		34
2002	96	10,203	967	1,681	414	13,441	230	56
2003	144	3,221	513	1,306	381	5,565	102	35
2004	52	2,968	842	1,277	95	5,234	291	24
2005[a]	a	a	a	a	a	a	a	a
1985-2004 Average	40	1,607	668	1,097	144	3,556	488	26

Source: ADF&G, Division of Subsistence, data files; gear types include set gillnet, rod/reel, and handline.

[a] Harvest figures for 2005 unavailable.

Appendix A33.–Salmon set gillnet catch in numbers of fish by species and permit/effort information for the Seldovia area subsistence fishery, Lower Cook Inlet, 1996–2005.

	Number of Permits				Number of Salmon Harvested					
YEAR	Issued	Returned	Fished	Not Fished	Chinook	Sockeye	Coho	Pink	Chum	Total
Early Season: April–May[a]										
1996	41	41	13	28	51	7	0	0	0	58
1997	19	16	12	4	44	19	0	0	0	63
1998	20	19	10	9	132	61	0	8	0	201
1999	16	15	12	3	150	130	0	0	38	318
2000	28	21	17	4	189	249	0	0	14	452
2001	19	17	14	3	134	124	0	0	0	258
2002	20	18	12	6	123	222	0	0	3	348
2003	19	13	10	3	67	210	0	1	54	332
2004	13	10	9	1	91	63	0	0	15	169
2005	15	13	4	9	46	0	0	0	0	46
Average	21	19	12	7	103	109	0	1	12	225
Late Season: August										
1996	4	3	1	2	0	1	0	0	0	1
1997	1	1	0	1	0	0	0	0	0	0
1998	3	2	1	1	0	0	0	0	0	0
1999	0									
2000	0									
2001	0									
2002	1	1	1	0	0	9	13	31	6	59
2003	1	1	1	0	0	10	1	12	1	24
2004	1	1	1	0	0	0	4	0	0	4
2005	3	2	2	0	0	70	13	93	12	188
Average	1	2	1	1	0	13	4	19	3	39

[a] Season dates in 1996 and 1997 were from April 1–May 20; subsequent years were from April 1–May 30.·

Appendix A34.–ADF&G, CIAA, and/or CRRC salmon stocking projects and releases of salmon fry, fingerling, and smolt, in millions of fish, Lower Cook Inlet, 1985–2005 (currently active projects highlighted in gray).

	Juvenile Sockeye Salmon															
YEAR	Leisure Lake	Hazel Lake	Tutka Bay	English Bay Lakes	Port Graham Hatchery	Chenik Lake	Paint River Lakes			Kirschner Lake	Bruin Lake	Ursus Lake	Port Dick Lake	Bear Lake	Grouse Lake	Total Sockeye
							Upper	Lower	Elusivak							
1985	2.018	---	---	---	---	---	---	---	---	---	---	---	---	---	---	2.018
1986	2.350	---	---	---	---	0.839	0.500	0.320	---	---	---	---	---	---	---	4.009
1987	2.022	---	---	---	---	1.000	---	---	---	0.867	---	---	0.705	---	---	4.594
1988	2.100	0.783	---	---	---	2.600	1.100	0.552	0.521	0.521	---	---	0.222	---	---	8.399
1989	2.000	1.000	---	---	---	3.500	1.000	0.500	0.500	0.250	---	---	0.430	2.200	---	11.380
1990	1.750	1.250	---	0.350	---	3.250	1.000	0.500	0.500	0.250	0.500	---	---	2.400	---	11.750
1991	2.000	1.300	---	0.241	---	2.200	0.500	0.250	---	0.250	0.250	---	---	1.619	---	8.610
1992	2.000	1.000	---	0.290	---	2.750	0.500	0.250	---	0.250	0.250	0.250	---	2.370	---	9.910
1993	2.000	1.000	---	0.581	---	1.400	0.500	0.250	---	0.250	0.250	0.250	---	1.813	---	8.294
1994	0	0	---	0.800	---	0	0	0	---	0.300	0	0	---	0.170	0.570	1.327
1995	1.632	1.061	---	0	---	1.129	0.337	0.251	---	0.251	0.251	0.252	---	0.360	0.793	6.287
1996	1.490	1.030	---	0.155	---	0.951	0.500	0	---	0.250	0.250	0.250	---	0.864	0	5.657
1997	2.000	1.000	---	0.199	---	0	---	---	---	0.250	---	---	---	0.788	1.966	6.203
1998	2.005	1.302	---	0	---	---	---	---	---	0.250	---	---	---	0.265	1.288	5.610
1999	0.265	0.453	---	1.149[a]	---	---	---	---	---	0.173	---	---	---	1.380	0	3.420
2000	1.708	1.248	---	1.006[b]	---	---	---	---	---	0.248	---	---	---	1.794	---	6.004
2001	0.089	0	---	0	---	---	---	---	---	0	---	---	---	0.145	---	0.234
2002	2.249	1.280	---	0	---	---	0.500[c]	---	---	0.302	---	---	---	2.407	---	6.738
2003	2.240	1.547	---	0.695	---	---	---	---	---	0.298	---	---	---	1.801	---	6.581
2004	2.002	0.351	---	0.050	0.110	---	---	---	---	0.251	---	---	---	3.012	---	5.776
2005	2.252	1.558	0.096	0.203	0	---	---	---	---	0.316	---	---	---	3.422	---	7.846
’85–04 Average	1.689	0.913		0.368		1.635	0.536	0.261	0.507	0.289	0.250	0.200	0.452	1.454	0.762	6.165
’95–04 Average	1.555	0.919		0.325	0.110	0.693	0.446	0.126		0.226	0.251	0.251		1.270	0.880	5.301

-continued-

Appendix A34.–Page 2 of 2.

YEAR	Juvenile Pink Salmon					Juvenile Chinook Salmon						Juvenile Coho Salmon					
	Tutka Bay Hatchery	Halibut Cove Lagoon	Homer Spit	Port Graham Hatchery	Total Pink Salmon	Seldovia Bay	Halibut Cove Lagoon	Homer Spit		Resurrection Bay[d]	Total Chinook	Caribou Lake	Seldovia Lake	Homer Spit		Resurrection Bay[e]	Total Coho
								Early	Late					Early	Late		
1985	23.500	---	---	---	23.500	---	0.098	0.152	---	0.186	0.436	0.139	0.083	---	---	0.407	0.629
1986	23.100	2.000	---	---	25.100	---	0.101	0.104	---	0.101	0.306	0.138	0.072	---	---	0.728	0.938
1987	20.500	3.000	0.295	---	23.795	0.084	0.094	0.104	---	0.096	0.378	0.150	0.045	---	---	0.604	0.799
1988	12.000	3.000	0.300	---	15.300	0.084	0.094	0.104	---	0.205	0.487	0.150	0.045	---	0.060	0.530	0.785
1989	30.100	6.000	0.332	---	36.432	0.108	0.115	0.104	---	0.307	0.634	0.182	0.080	---	0.143	0.339	0.744
1990	23.600	6.000	0.303	---	29.903	0.099	0.112	0.212	---	0.329	0.752	0.180	0.050	---	0.123	1.540	1.893
1991	23.600	6.000	0.303	0.255	30.158	0.091	0.092	0.191	---	0.466	0.840	0.180	0.050	---	0.100	0.599	0.929
1992	23.600	6.000	0.300	1.800	31.700	0.113	0.117	0.226	0.126	0.370	0.952	0.150	---	---	0.100	0.265	0.515
1993	43.000	6.000	---	0	49.000	0.107	0.100	0.212	0.100	0.290	0.818	0.150	---	---	0.116	0.843	1.109
1994	61.000	---	---	1.295	62.295	0.106	0.107	0.192	0.157	0.270	0.832	0.064	---	---	0.156	0.560	0.780
1995	63.000	---	---	0.358	63.358	0.113	0.036	0.228	0.124	0.315	0.816	---	---	---	0.110	0.701	0.811
1996	105.000	---	---	6.470	111.470	0.109	0.103	0.101	0.121	0.415	0.849	---	---	---	0.150	0.676	0.826
1997	89.000	---	---	0.910	89.910	0.092	0.078	0.216	0.105	0.521	1.012	---	---	---	0.120	0.807	0.927
1998	90.000	---	---	0	90.000	0.079	0.073	0.137	0.120	0.307	0.716	---	---	---	0.148	0.726	0.874
1999	60.132	---	---	4.617	64.749	0.074	0.079	0.163	0.059	0.174	0.549	---	---	---	0.137	0.529	0.666
2000	65.120	---	---	1.144	66.264	0.068	0.083	0.220	---	0.322	0.693	---	---	---	0.122	0.618	0.740
2001	99.336	---	---	27.299	126.635	0.103	0.107	0.208	---	0.228	0.646	---	---	0.125	0.100	0.681	0.906
2002	100.000	---	---	6.604	106.604	0.083	0.106	0.190	---	0.194	0.573	---	---	0.096	0.121	0.770	0.987
2003	67.967	---	---	57.158	125.125	0.108	0.107	0.206	---	0.220	0.641	---	---	0.223	0.103	0.903	1.229
2004	47.964	---	---	36.283	84.247	0.089	0.104	0.169	---	0.216	0.578	---	---	0.130	0.113	0.955	1.198
2005	---	---	---	26.568	26.568	0.115	0.113	0.221	---	0.312	0.761	---	---	0.126	0.091	1.153	1.370
’85–04 Average	53.576	4.750	0.306	10.300	62.777	0.095	0.095	0.172	0.114	0.277	0.675	0.148	0.061	0.144	0.119	0.667	0.914
’95–04 Average	78.752	---	---	14.084	92.836	0.092	0.088	0.184	0.106	0.291	0.707	---	---	0.144	0.122	0.745	0.916

[a] Sockeye release at English Bay consisted of 918,000 fry released in Nov. 1999 and 231,000 fry held over winter for release in spring 2000.
[b] Sockeye release at English Bay consisted of 906,000 fry released in summer 2000 and an estimated 100,000 fry held over winter for release in spring 2001.
[c] Fall fry (“pre-smolt”) release.
[d] Chinook releases in Resurrection Bay are a cumulative total for all locations.
[e] Coho releases in Resurrection Bay are a cumulative total for all locations.

APPENDIX B. HISTORICAL HERRING TABLES

Appendix B1.–Catch of Pacific herring *Clupea pallasi* in short tons and effort in number of permits by district in the commercial sac roe seine fishery, Lower Cook Inlet, 1985–2005.

	Southern		Kamishak		Eastern		Outer		Total	
Year	Tons	Permits	Tons	Permits	Tons	Permits	Tons	Permits	Tons	Permits
1985	---	---	1,132	23	204	7	12	2	1,348	29
1986	---	---	1,959	54	167	4	28	3	2,154	57
1987	---	---	6,132	63	584	4	202	9	6,918	69
1988	---	---	5,548	75	0	0	0	0	5,548	75
1989	170	6	4,801	75	0	0	0	0	4,971	75
1990	---	---	2,264	75	---	---	---	---	2,264	75
1991	---	---	1,992	58	0	0	0	0	1,992	58
1992	---	---	2,282	56	0	0	0	0	2,282	56
1993	---	---	3,570	60	---	---	---	---	3,570	60
1994	---	---	2,167	61	---	---	---	---	2,167	61
1995	---	---	3,378	60	---	---	---	---	3,378	60
1996	---	---	2,984	62	---	---	---	---	2,984	62
1997	---	---	1,746[a]	45[a]	---	---	---	---	1,746	45
1998	---	---	331[a]	20[a]	---	---	---	---	331	20
1999	---	---	100[b]	1[b]	---	---	---	---	100	1
2000	---	---	---	---	---	---	---	---	---	---
2001	---	---	---	---	---	---	---	---	---	---
2002	---	---	---	---	---	---	---	---	---	---
2003	---	---	---	---	---	---	---	---	---	---
2004	---	---	---	---	---	---	---	---	---	---
2005	---	---	---	---	---	---	---	---	---	---
20-Year Average	170	6	2,692	56	136	2	35	2	2,784	57
1985-1994 Average	170	6	3,185	60	136	2	35	2	3,321	61
1995-2004 Average	---	---	1,708	47	---	---	---	---	1,708	47

Source: ADF&G fish ticket database *Unpublished*.

[a] Includes both commercial harvest and ADF&G test fish harvest.

[b] Commercial fishery closed, ADF&G test fish harvest only.

Appendix B2.–Preseason estimates of biomass and projected commercial sac roe seine harvests, and actual harvests, for Pacific herring *Clupea pallasi* in short tons, average roe recovery, numbers of permits making landings, and exvessel value in millions of dollars, Kamishak Bay District, Lower Cook Inlet, 1985–2005.

Year	Preseason Forecasted Biomass (st)	Preseason Projected Harvest (st)[a]	Actual Commercial Harvest (st)[a]	Average Roe %	No. of Permits w/Landings	Exvessel Value[b] ($ millions)
1985	[c]	[d]	1,132	11.3	23	1.00
1986	[c]	[d]	1,959	10.4	54	2.20
1987	[c]	3,833	6,132	11.3	63	8.40
1988	[c]	5,190	5,548	11.1	74	9.30
1989	37,785	5,000	4,801	9.5	74	3.50[e]
1990	28,658	2,292	2,264	10.8	75	1.80
1991	17,256	1,554	1,992	11.3	58	1.30
1992	16,431	1,479	2,282	9.7	56	1.40
1993	28,805	2,592	3,570	10.2	60	2.20
1994	25,300	3,421	2,167	10.6	61	1.50
1995	21,998	2,970	3,378	9.8	60	4.00
1996	20,925	2,250	2,984	10.1	62	6.00[e]
1997	25,300	3,420	1,746	9.3	45	0.40
1998	19,800	1,780	331	8.5	20	0.07
1999	[f]	---	- closed -	---	---	---
2000	6,330	---	- closed -	---	---	---
2001	11,352	---	- closed -	---	---	---
2002	9,020	---	- closed -	---	---	---
2003	4,771	---	- closed -	---	---	---
2004	3,554	---	- closed -	---	---	---
2005	3,058	---	- closed -	---	---	---
1985-2004 Average	16,647	2,982	2,878	10.3	56	3.08

[a] Kamishak Bay allocation only, does not include Shelikof Strait food/bait allocation.
[b] Exvessel values exclude any postseason retroactive adjustments (except where noted).
[c] Prior to 1989, preseason forecasts of biomass were not generated.
[d] Prior to 1987, preseason harvest projections were not generated.
[e] Includes retroactive adjustment.
[f] 1999 preseason biomass calculated as a range of 6,000 to 13,000 st.

Appendix B3–Summary of herring sac roe seine fishery openings and commercial harvests in the Kamishak Bay District of Lower Cook Inlet, 1969–2005.

Year	Dates of Openings	Total Hours Open	Harvest (short tons)	Catch Rate (short tons/ hour open)	Number of Permits w/Landings
1969 - 1973	No closed periods				
1974	1/1 - 5/20		2,114		26
1975	1/1 - 6/6	(Closed Iniskin Bay 5/17)	4,119		40
1976	1/1 - 5/21	(Closed Iniskin Bay 5/17; reopened Kamishak 6/2)	4,824		66
1977	1/1 - 5/31	(Closed Kamishak Dist. 5/12; reopened 5/14 - 5/17; reopened 5/29 - 5/31)	2,908		57
1978[a]	4/16 -	96	402	4.2	44
1979	5/12 -	72	415	5.8	36
1980 - 1984	CLOSED	0	0		
1985	4/20 -	1,350 (56.2 days)	1,132	0.8	23
1986	4/20 -	1,303 (54.3 days)	1,959	1.5	54
1987	4/21 -	65	6,132	94.3	63
1988	4/22 -	42	5,548	132.1	74
1989	4/17 -	24.5	4,801	196.0	74
1990	4/22 -	8	2,264	283.0	75
1991	4/26	1	1,992	1,992.0	58
1992	4/24	0.5	2,282	4,564.0	56
1993	4/21	0.75	3,570	4,760.0	60
1994	4/25 4/29	0.5 1.0	778 1,338	1,556.0 1,338.0	35 53
1995	4/27 4/28	0.5 1.0	1,685 1,693	3,370.0 1,693.0	45 44
1996	4/24	0.5	2,984	5,968.0	62
1997	4/25[b] 4/29 4/30 5/1 5/22[d]	0.5 1.5 8.0 12.0 [d]	0 1,580 61 51 54	0 1,053.3 7.6 4.3 [d]	0 42 [c] 4 ---
1998	4/21 4/22 5/14[d] 5/22[d]	0.5 2.0 [d] [d]	160 136 10 23	320.0 68.0 [d] [d]	12 11 --- ---
1999-2005	CLOSED	0	100[d]		

[a] Management by emergency order began.

[b] Despite the open fishing period, the entire fleet collectively agreed not to fish due to ongoing price negotiations with processors.

[c] To comply with **AS 16.05.815 CONFIDENTIAL NATURE OF CERTAIN REPORTS AND RECORDS**, effort data has been masked where fewer than 4 vessels fished in a given area.

[d] ADF&G test fishing harvest in 1999.

Appendix B4.–Estimates of Pacific herring *Clupea pallasi* total biomass in short tons using two different methods, actual commercial sac roe seine harvest in short tons, and percent exploitation, Kamishak Bay District, Lower Cook Inlet, 1985–2005.

Year	Aerial Survey Total Biomass Estimate (st)[a]	ASA Model Total Biomass Estimate (st)[b,c]	Actual Commercial Harvest (st)	Estimated Exploitation Rate (%)[b]
1985	13,320	34,945	1,132	3.2
1986	26,001	31,904	1,959	6.1
1987	35,332	31,423	6,132	19.5
1988	29,548	24,659	5,548	22.5
1989	35,701	19,891	4,801	24.1
1990	19,664	15,551	2,264	14.6
1991	18,163[d]	16,381	1,992	12.2
1992	24,077	14,598	2,282	15.6
1993	32,439	12,556	3,570	28.4
1994	25,344[d]	10,077	2,167	21.5
1995	25,115	7,952	3,378	42.5
1996	27,640	6,077	2,984	49.1
1997	---	4,140	1,746	40.8
1998	---	3,316	331	10.0
1999	---	3,028	- closed -	---
2000	---	2,910	- closed -	---
2001	---	2,636	- closed -	---
2002	---	2,455	- closed -	---
2003	---	2,394	- closed -	---
2004	---	2,362	- closed -	---
2005	---	2,346	- closed -	---
1985-2004 Average	26,029	12,470	2,878	17.1

Source: Otis 2004; Otis and Cope 2004; Yuen 1994.

[a] Diverse methods have been used to generate historical aerial survey biomass estimates; after 1989, see LCI herring forecast report or statewide herring forecast document to determine specific method for individual year.

[b] Figures are based on the best available data at the time of publishing and are subject to change; therefore all figures herein supersede those previously reported.

[c] ASA model integrates heterogeneous data sources and simultaneously minimizes differences between observed and expected return data to forecast the following year's biomass as well as hindcast previous years' biomass.

[d] Due to poor aerial survey conditions, biomass was calculated from the preseason estimate of abundance, adjusted to match observed age composition samples in the commercial catch.